

DAN: Your Dive Safety Association

ALERT Diver

Autumn Edition 2009, Vol 1 No 1

EAR PROBLEMS • MALARIA PROPHYLAXIS • HEADACHES

Managing your diving-related headache

**Practical Advice:
Diving with ear problems**

**Malaria medication:
What to Take When Diving**

**What is DAN?
The Essential Guide
to DAN Membership
and Cover**



ISSN 2071-7628

 **DAN**[®]
SOUTHERN AFRICA
DIVERS ALERT NETWORK

“

*...swift and quick service,
I wish other service providers
would act like that!*

”

Michael, DAN Member

Divers Alert Network is a buddy like no other to tens of thousands of divers around the world, just like Michael. As a non-profit medical and research organisation, we are dedicated to the safety and health of all recreational scuba divers. Our membership, assistance services and product sales all support the unique resources we offer to our community. So join us, and you will help us to keep helping divers, just like you... and Michael.

That is being a real buddy.

www.dansa.org

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A First for DAN-SA



“
We are delighted and proud to offer you the first biannual edition of our own, DAN Southern Africa Alert Diver Magazine!
 ”

Dear DAN members

We are delighted and proud to offer you the first biannual edition of our own, DAN Southern Africa *Alert Diver* Magazine!

Following a poll from our members last year, we had unanimous acceptance for a local version of *Alert Diver* with electronic updates of date-sensitive events and advertisements. We look forward to this new era for DAN Southern Africa. Please continue to provide us with comments and suggestions to allow us to better meet your needs through this publication.

For these first two editions of *Alert Diver*, we have decided to include information and articles that will be of long-term value to divers and DAN Southern Africa members in particular. As such, we have reviewed our hotline calls over the past 10 years and identified the leading areas where divers need or request information most frequently. These include – in order of popularity: (1) Ear problems; (2) Malaria prophylaxis; (3) Headaches and diving; (4) What to do in

the case of decompression illness in remote locations; (5) How diving instructors, operators and resorts might be better prepared for diving emergencies and partner with DAN; (6) What are the key issues in diving fitness with updates on asthma, epilepsy and diabetes; (7) How to file a claim; (8) How to make the best use of your DAN membership.

In addition to these eight important issues and questions, we want to offer you a bird's eye view of what DAN is doing locally, and internationally, in the areas of diving medicine and research.

We hope that you will enjoy reading this first edition of *Alert Diver* as much as we have enjoyed writing it.

Dr Frans J Cronjé
 President and CEO DAN Southern Africa



THE TEAM



Dr Frans Cronjé



Francois Burman



Helia van Zyl



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Dawn Carver



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FRONT COVER



Image by Sean Sequeira (Shootout 2008)

IN A DIVE EMERGENCY

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OR

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DAN PUBLICATION PHILOSOPHY

Alert Diver Southern Africa is a forum for ideas and information relative to diving safety, education and practice. Any material relating to diving safety or diving medicine is considered for publication. Ideas, comments and support are encouraged and appreciated.

The views expressed by contributors are not necessarily those advocated by DAN. While every effort is made to ensure the accuracy of information and reports in the *Alert Diver* Southern Africa, the publisher does not accept any responsibility, whatsoever, for any errors, omissions, or for any effects resulting therefrom. As to the best of the publisher's knowledge, contributors have not indulged in plagiarism. Although the utmost is done to avoid such occurrences, the publisher will not be held responsible for the contributors' or writers' indulgence in plagiarism. No part of this publication may be used or reproduced in any form, without the written permission of the publisher.

DAN is a neutral public service organisation that attempts to interact with all diving-related organisations or persons with equal deference. *Alert Diver* Southern Africa is published for the diving public, and is not a medical journal. The use and dosage of any medication by a diver should be taken under the supervision of his/her physician.

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SUBMISSIONS

Submissions of articles and photographs for publication are welcome, but the publisher, while exercising all reasonable care, cannot be held responsible for any loss or damage and all due care will be taken with submitted material. *Alert Diver* assumes no responsibility to return unsolicited editorial or graphic material. All material will be subjected to *Alert Diver's* unrestricted right to edit any submission received, and the owner thereby consents that the publisher may publish the material in any other media as deemed necessary.

Please ensure that your material is sent to alertdiversa@dansa.org or to *Alert Diver* Magazine, Private Bag x 197, Halfway House 1685. Images should be 300 DPI and should be accompanied by a caption and the name of the photographer. Copyright © 2009 by Divers Alert Network Southern Africa. All rights reserved.

TABLE OF CONTENTS

Autumn 2009, Vol 1 No 1

DAN Medical

- 20 Diving with ear problems
Practical advice
- 26 The asthmatic diver...
How does asthma affect diving possibilities?
- 32 Headaches and diving
- 36 Malaria
Prevention and prophylaxis
- 42 Fitness to dive
Are you fit?

DAN Research

- 28 DAN research activities
- 35 Diabetes and diving
- 40 Decompression illness in
remote locations

DAN Training

- 16 DAN training and education
- 25 DAN Diving Safety Partners
Programme

DAN Regulars

- 1 Message from Dr Frans Cronjé
- 4 Letters and comments
- 4 Diving humour
- 6 Meet the team
- 14 DAN medline
- 46 DAN products
- 48 Parting shot

10 DAN Membership



20 Ear Problems



32 Headaches



40 Decompression Illness



42 Fitness to dive



DAN Letters & Comments



To DAN

Thank you very much for a phenomenally efficient service! It is so amazing to find a service provider whose services are so prompt and hassle-free. A few minutes on the Internet and within a few hours I had received confirmation of renewal via a range of media.

I dive frequently with "new" student divers, and my dive buddies and I always make a point of telling them how great DAN is and how worthwhile it is to be a member. I always add that it is so easy to join/renew. Thank you very much and keep up the good work.

Neil

DAN member

DAN member. Usually what people do and what they say are two different things, but I can truly say that DAN delivers on their promises.

I have made a full recovery and cannot wait to get back into the water. Thank you for the professional help and advice, it is appreciated.

Morne

DAN member

Send your letters to:
Alert Diver Magazine
Private Bag X197
Halfway House 1685
or email to:
alertdiversa@dansa.org

FISH FUNNIES

Sometimes fish have their funny moments too, you know. Share your funny fish images with us by sending your image and funny caption to alertdiversa@dansa.org



Image by Sean Sequeira

After reading about diving and headaches in Alert Diver Southern Africa, Seymour will never endure a killer diving headache again!

DAN

I have just registered online for the DAN-SA Family Membership and received a fax of confirmation with our membership number. I must compliment you on your speedy replies and exceptional competence in registering new members. Please tell all involved in doing this that it is much appreciated.

Suzette

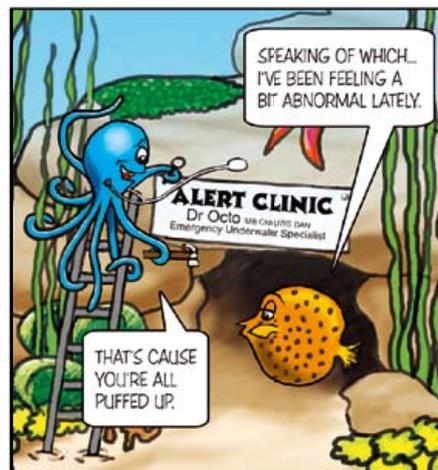
New DAN member

Dear DAN

I would like to thank you for your help this week when I had an "accident".

Your service was tops and I was surprised at how well I was treated.

I have read all the brochures, and DAN really did what they promised and I am proud to be a



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 **PROMASTER**



Meet the Team

In 2006, DAN-SA celebrated its ten year anniversary. From its humble beginning, with less than 1 000 members, DAN-SA now has nearly 9 000 members, its own offices, seven board members (Dr Frans Cronjé, Mr Francois Burman, Dr Allan Kayle, Prof Alessandro Marroni, Prof Barney De Villiers, Dr Andy Branfield and Mr Don MacRobert), two company directors, a medical director, five part-time hotline physicians and five full time staff members.

We owe an enormous debt of gratitude to our members. Without your support DAN would not exist. We also owe our success to the wonderful and dedicated team of people who have worked very hard to make DAN what it is today.

Dr Frans Cronjé founded DAN-SA in 1996 and served as its first board member. Today, he serves as President and Managing Director together with Francois Burman, who joined DAN-SA in December 1998 as Financial and Operations Director.

CORE TEAM

DR FRANS CRONJÉ



Frans is the founder, President and Managing Director of DAN-SA. He is a board member of DAN Europe and International DAN. He is a NAUI instructor (since 1991), trained as a commercial diver and chamber supervisor and a DAN instructor trainer examiner. He is considered the leading pioneer of modern hyperbaric oxygen therapy in southern Africa and has dedicated his professional career to introduce and expand this scientific,

therapeutic modality in South Africa. He is a General Medical Practitioner with an MBChB and an MSc in Aerospace Medicine from the University of Pretoria. He completed an academic Fellowship in Diving, Hyperbaric and Underwater Medicine at Duke University, Durham, NC, USA in 2003. Formerly in private practice at the Eugene Marais Wound Care and Hyperbaric Therapy Centre, he now serves as a diving and aviation medical examiner and a consultant in otolaryngological aspects of aerospace, diving and hyperbaric medicine in Pretoria and Cape Town; he has a special interest in dizziness and balance disorders. He is a researcher and part-time senior lecturer at the Department of Interdisciplinary Health Sciences (University of Stellenbosch). He is the past President of the Southern African Undersea and Hyperbaric Medical Association (SAUHMA) and President of the International Congress for Hyperbaric Medicine (ICHM) that will be hosting its 17th international meeting in Cape Town in 2011. He is an avid scuba diver!

FRANCOIS BURMAN



Francois accepted the position of Financial and Operations Director for DAN-SA in December 1998. He is currently responsible for the operational, technical, safety, financial and insurance aspects of DAN and its programmes. Due to his vision and expertise in international recompression chamber manufacture, he was commissioned by International DAN (IDAN) in 1999 to develop a system for evaluating recompression

chambers, appropriate for the treatment of decompression illness of scuba divers around the globe. This programme is known

globally as the Recompression Chamber Assistance and Partnering Programme (RCAPP). Francois has a BSc degree in Mechanical Engineering from the University of Cape Town. He spent eight years of his working career with the Atomic Energy Corporation of South Africa. A career change in 1994 took him into the realms of hyperbaric technology, when he joined a Cape Town based company which specialised in life-support and underwater engineering. It was during these next seven years that he was able to further his interests in diving and hyperbaric medical technology eventually joining DAN-SA in 1998. He serves as Treasurer on the board of International DAN and is the technical consultant for the various international recompression chamber assistance programmes. Francois is also an active scuba diver.

HELIA VAN ZYL

Helia has been working at DAN-SA since February 2001 when DAN was still part of Medical Rescue International. Helia commenced her career in the hospitality industry, working mainly in southern Mozambique at a diving resort; she then went on to further her studies in Business Management. Helia is an experienced DAN Instructor and has the additional benefit of being fluent in Portuguese. Helia serves as our DAN Office Manager where she is responsible for the operational aspect of Membership Services and the staff. We credit her – together with her staff – for the excellent growth DAN has enjoyed as the leading diving safety organisation in southern Africa. Helia has been diving since 1999.



MORNE CHRISTOU

Morne started with DAN in February 2006. Morne started his career at the Knysna Elephant Park and went on to work at various diving resorts in southern and northern Mozambique, serving respectively as tour operator, dive guide and water sports manager. Morne manages DAN-SA's Special Projects and Marketing, and is also our Diving Safety Partners Programme (DSP) Co-ordinator. Morne was instrumental in managing the building of the DAN offices. His diligence and attention to detail are remarkable. He spent most of 2006 and 2007 setting up the chamber support programme in Zanzibar. Morne regularly attends events all over southern Africa, visiting dive shops and implementing the various DAN training and membership



programmes, and various other DAN projects, wherever he goes. Morne has been diving since 1999 and is currently an active PADI instructor.

DAWN CARVER



After ten years with Netcare 911, where she was actively involved with the DAN hotline, Dawn started working for DAN-SA as an in-house DAN Medic in January 2009. Dawn has extensive experience in the paramedical, operations, and emergency evacuations field. She started off as a volunteer in the emergency services while still at school, and then decided to make this a career. She holds a qualification as an Ambulance

Emergency Assistant. Dawn has specialised in Air Evacuation and Repatriation, internationally and locally. She was a team leader at the Netcare flight desk for the past two years before joining the DAN-SA team. Dawn is responsible for supporting the Medical Information and Emergency Hotline services during office hours. She continues to work closely with Netcare when further assistance or evacuation is required and provides important quality assurance and customer care related to these calls. Dawn offers a uniquely personal and even more caring dimension to the services DAN offers its members and divers at large. Dawn is an open water diver and has been diving since 2007.

SEL-MARIE PEREIRA



Sel-Marie started with DAN in April 2002. She began her career in the vehicle finance industry working in customer service. She then went on to vehicle sales and client services. Sel-Marie is our DAN Membership Services Administrator. She is responsible for all aspects of membership administration, data capturing and sales. Sel-Marie is a wonderful asset to the DAN Team with her dedication and attention to detail. She has been diving since 2001.

TONI MCQUILLEN



Toni started with DAN in June 2008. Following a sojourn in promotions, Toni went on to pursue a career in the diving industry where she has worked her way up to master diver, obtaining various specialties and working in a dive shop for many years. Toni serves as our Membership Services Assistant and is responsible for assisting in the general day to day administration of DAN-SA membership as well as the student membership. Toni has been diving since 2002.



MEDICAL TEAM

DR JACK MEINTJES



Jack has been the medical Director of DAN-SA since 2007, he is a full fellow of the College of Public Health Medicine of South Africa (Occupational Medicine) and holds the MMed (Occupational Medicine) degree and is a consultant in occupational medicine at the University of Stellenbosch. He has successfully completed various courses and formal qualifications in Diving and Hyperbaric Medicine and personally

developed the curriculums for the BScMedScHons (Underwater Medicine) and BScMedScHons (Hyperbaric Medicine) degree programmes. He worked at the Institute for Maritime Medicine as head of diving and submarine medicine from 2001 to 2003, providing medical support to the SA Navy divers. He is serving on the Diving Council of the Department of Labour and advises the Chief Inspector on commercial diving medical matters. He currently lectures in the Division of Community Health (University of Stellenbosch) and provides post-graduate occupational health as well as hyperbaric and diving medical training. He also chairs the diving medical panel, dealing with complicated fitness to dive issues. Dr Meintjes also developed the curriculum for the refresher course in Underwater Medicine for diving doctors. Dr Meintjes is an active diver with not only recreational diving and hyperbaric medicine expertise but also vast commercial diving medical knowledge and experience.

DR FRANS CRONJÉ

Frans is the founder, President and Managing Director of DAN-SA. He is a board member of DAN Europe and International DAN.

DR ISABEL DU PREEZ



Isabel was the first DAN doctor in Zanzibar on call at the EAHC (East Africa Hyperbaric Centre) medical facility. She graduated from the University of Pretoria in 2003, attaining her MBChB. In 2007 she completed a BScMedSci(Hons) in Underwater Medicine from the University of Stellenbosch. Dr Du Preez is currently one of the Directors of the emergency rooms at Akasia Hospital in Pretoria. Diving is one of her greatest

passions. She says that working with such a wonderful group of committed and like-minded professionals is a privilege and pleasure to her.

DR MIKE MARSHALL



Mike obtained his MBChB degree from WITS University in 1985. In 1987 he received a BScMed(Hons) in Sport Science from the University of Cape Town. He completed the Diving and Submarine Medicine Diploma at the Institute for Maritime Medicine in 1988; the Fellow of the College of Surgeons (SA) Part 1a (SA College of Medicine) in 1989; Advanced Trauma Life Support (AEMS in Durban) in 1994; Advanced Cardiac Life

Support (AEMS, Durban) in 1997; Diving and Hyperbaric Medicine Staff Training Course (Pretoria) in 1999; Bennett and Elliott's Physiology and Medicine of Diving Course (IMM) in 2002; Certified Hyperbaric Technologist Certification (via NBDHMT, Louisiana) in 2003. He serves as the Medical Director for the St Augustine's Hyperbaric Medicine Centre since its inception in 2000. He has been a part-time medical officer to DAN since 2002.

DR LOURENS DE KOCK



Lourens is one of the partners in a busy diving, aviation and maritime medical practice in Cape Town. Born in Mapumalanga and growing up in KwaZulu-Natal, Lourens has always had a love for the sea. Diving and Diving Medicine are his passion and have taken him around the world, often as a diving medical officer responsible for commercial diving operations off-shore. With both a medical degree and a

BScMedSc(Hons) degree in Diving and Underwater Medicine from the University of Stellenbosch (SUN), Lourens brings considerable experience, knowledge and passion to DAN.

DR GARY MORRIS



Gary is a general medical practitioner from Scottburgh, KwaZulu-Natal. His proximity to Aliwal Shoal and a love and compassion for people and their general health have rapidly expanded his medical activities to encompass diving medicine. Being introduced to the underwater realm several years ago has further expanded his interest. Gary is also completing his BScMedSc(Hons) in Diving and Underwater Medicine at SUN.

Apart from his medical degree, Gary also has a Diploma in Tropical Medicine and a Masters degree in Family Medicine. His love for the outdoors – sailing, snorkeling, and hiking – adds to a well-rounded background.

DR ROB SCHNEIDER



Rob is a general medical practitioner practising full-time in Emergency Medicine in Pretoria. He completed his medical degree and started diving in the year 2000. In addition to running a private level 1 Trauma Unit, Rob has accumulated a wealth of experience in clinical hyperbaric oxygen therapy. He is an avid scuba and breathhold diver. He is also completing a BScMedSc(Hons) training in Diving

and Underwater Medicine at SUN. We are delighted that Rob has joined our ranks; he brings important emergency medical knowledge and experience to the team.



FLIGHT DESK



JACQUES PIENAAR



LAUREL REYNEKE



MARTIN COETZEE



CORNE BOTHMA

Photographs not available at time of going to press

PHILLIP HOLT, FRANS DE BRUIN, LANA MCDONALD, DEANN LAWRENCE AND HELEEN NELL

INTERNATIONAL ASSISTANCE



LOUIS MABELE
Netcare Operations Manager



DENNY LOCKWOOD
Team Leader



MARIQUE WATERSON



SUSAN MAPHANGA



SHOESHOE TSOLO



ASHVEER SEEOBIN



PATIENCE MDULI



QUINTON STRYDOM

Photograph not available at time of going to press

ANDRE LE ROUX AND DANIEL KUIPERS



LERATO SETSHEDI

HOTLINE TEAM

During office hours, all calls to the DAN-SA hotline on 0800 020 111 or +27 828 10 60 10 will be taken by our in-house medic. After hours and overflow calls as well as emergency calls requiring evacuations will be answered by the DAN hotline staff at Netcare – these operators have been especially trained and have experience in dealing with DAN calls.

Alongside are operators that will take the DAN hotline calls after hours.



BEYOND BOUNDARIES

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Breaking boundaries with sophisticated technology and intuitive design, UWATEC introduces Galileo Sol, the ultimate graphic dive computer. Galileo Sol goes beyond the conventional with an innovative heart rate monitor for precise decompression calculations and a navigational system including a full-tilt, digital compass with bearing memory.

Made for divers of all levels, this user-friendly, interactive computer also boasts an exceptionally large dot matrix display screen with three display options and multiple personalization features.

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UWATEC

How to Make the Best Use of Your DAN Membership

By Helia van Zyl

WHY JOIN DAN?

DAN members help support a **24-hour hotline** – this hotline is supported by specialists trained in diving medicine, and is freely available to anyone. The DAN hotline can be called day or night 24/7/365 by any diver worldwide in the event of a dive emergency. Divers can be assured they will be talking to experts in the field and will get the best possible assistance from someone that “speaks their language”.

Your DAN membership subscription contributes towards the **24-hour emergency and information line**. Without your support, this service would not exist. The emergency and information line is manned by specialists in diving medicine and is freely available to anyone. Any diver can call for medical advice or referrals on any topic to do with diving. These queries are answered by experts in diving medicine and you can be assured that they will know exactly what you are talking about.

DAN membership supports a **network of chambers** worldwide. Without these, we would not be able to refer injured divers for specialist treatment.

DAN membership supports **research and training**. This is invaluable in keeping the diving public informed on the latest trends in diving medicine.

From experience we know that the name “DAN” means different things to different people. Some believe it is “diving insurance”, others think of us as the “scuba police”. The truth is – DAN is neither!

WHAT IS DAN?

At DAN, we get calls daily from divers wanting to sign up because their instructors have told them to, without them even knowing what DAN is about! To offer a simple explanation, which we would also like you to use when explaining DAN to your dive buddies and dive students, this is who we are:

Divers Alert Network (DAN) is a Section 21 not-for-profit emergency assistance organisation dedicated to the safety and health of recreational scuba divers worldwide. DAN Southern Africa (DAN-SA) is part of a worldwide network of organisations of divers helping divers.

Founded in the USA in 1980, DAN has served as a lifeline for the scuba diving industry by operating the only dedicated 24-hour diving emergency hotline in the world. Additionally, DAN operates a diving medical information hotline, conducts vital diving medical research and also develops and provides a number of first aid and continuing education programmes for everyone from novice divers to medical professionals.

DAN is supported by the largest association of recreational divers in the world (more than 240 000 divers) through membership dues and donations. In return, members receive a number of important benefits including emergency medical evacuation assistance, DAN educational publications, a subscription to *Alert Diver Magazine* and access to diving's first and foremost diving accident coverage.

DAN-SA was founded in 1996 in southern Africa, taking over the DivEvac product from MRI and starting with a database of around 1 000 divers. We have since grown from strength to strength and are now close to 9 000 members in southern Africa.

WHAT DOES DAN MEMBERSHIP INVOLVE?

To make the most of your membership, DAN members need to know the following:

The single greatest benefit is having 24-hour access to diving emergency assistance and advice via the DAN hotline. Every day, DAN gets calls on issues of diving fitness, malaria prophylaxis, ear problems, flying after diving, etc. In addition, as a DAN member, you are covered for certain benefits in the event of a dive injury, depending on your level of membership.

All DAN members have access to so much more that just cover in the event of a dive injury or accident.



WHAT ARE THE DAN MEMBERSHIP OPTIONS?

These are the basic differences between the different membership levels:

STANDARD	PLUS	MASTER
Max depth covered: 40 m	Max depth covered: 40 m	Max depth covered: 100 m (dives deeper than 100 m must be pre-approved by DAN-SA)
Actual costs of evacuation covered	Actual costs of evacuation covered	Actual costs of evacuation covered
No international non-diving medical cover	International non-diving medical cover	International non-diving medical cover
Dive emergency medical expenses: R 300 000	Dive emergency medical expenses: R 500 000	Dive emergency medical expenses: R 600 000
No <i>Alert Diver</i> Magazine subscription	<i>Alert Diver</i> Magazine subscription	<i>Alert Diver</i> Magazine subscription

FAMILY MEMBERSHIP VS DIVING FAMILY MEMBERSHIP – WHAT IS THE DIFFERENCE?

We introduced the Diving Family Membership in 2006, this is a discounted membership for a family with more than one diver in the household, there is a fee for each additional diver added under the main member.

Non-Diving Family Membership is for members where there is only one diver in the household – this will be the main DAN member. Non-diving immediate family members, such as spouses and children, can be added on at no extra charge. However, the other members are **not covered** for diving, even if they become divers at a later stage.

These are the main differences between a Diving Family Membership and a Non-diving Family Membership:

	DIVING FAMILY	NON-DIVING FAMILY
WHO QUALIFIES	Immediate family members of a main DAN member who are divers and live under the same roof as the main member	Immediate family members of a main DAN member who are NOT divers and live under the same roof as the main member
COST	Discounted cost per diver	Only the main members pay – all non-divers are FREE
DIVING ACCIDENTS	Covered	Not Covered
NON-DIVE ACCIDENTS (only covered when travelling outside country of residence for a max. period of 90 days)	Covered – up to R 600 000 cover for medical expenses for covered injuries or accidents on international trips depending on the membership level. (Plus and Master Member only)	Covered – up to R 600 000 cover for medical expenses for covered injuries or accidents on international trips depending on the membership level. (Plus and Master Member only)
EVACUATIONS	Covered – Evacuations in a medical emergency whenever you travel more than 100 km from home or are on a dive trip	Covered – Evacuations in a medical emergency whenever you travel more than 100 km from home or accompany a main member on a dive trip

Please refer to the DAN website for further information and specific details on cover for the various membership levels, as well as terms, conditions and exclusions.

We encourage you to make use of the Diving Family Membership – it saves you money and it is so much easier to keep track of the membership if everyone is under one membership.

MONTHLY VS ANNUAL PAYMENT

There are two ways to pay for your DAN membership – either annually or monthly. DAN-SA membership is valid for a minimum of 12 months. If you have chosen to pay your membership by debit order, it will continue for a minimum of 12 months and will keep going until the day you cancel it. There will be no expiry date on the membership cards.

Members who opt to pay for their membership annually will need to renew annually. DAN-SA will send them reminders. **AD**



MEMBERSHIP RESOURCES

ONLINE SERVICES

Did you know that you can access your membership information online? You can login and view your membership, change details and upgrade or renew your membership. Go to www.dansa.org and click on LOGIN.

The DAN-SA website also has a vast amount of information and resources available to DAN members – from medical articles and downloads to information on membership benefits.

THE DAN EMERGENCY HANDBOOK

All new DAN members receive a DAN Emergency Handbook when they sign up – take the time to read through it. This is such an interesting resource.

YOUR DAN MEMBERSHIP CARD

Keep this in a safe place where it is easily accessible. Save your membership number and the emergency numbers on your cell phone. This is all you need in the event of an emergency.

COMPLIMENTARY DAN MEMBER TAG

Each NEW member that signs up receives a DAN tag. We encourage members to place these tags on their dive gear in a visible place – this tag speaks for you when you cannot!

We strongly encourage DAN members to make use of these services, after all, the more informed you are about your membership, the more you can get out of it.

How to File a Claim

By Helia Van Zyl

1 CALL DAN HOTLINE

From inside SA call TOLL FREE: 0800 020 111
From outside SA call: +27 828 10 60 10

2 FILL IN A CLAIM FORM



DAN office:
0860 242 242, or if calling from outside SA, +27 11 312 0512.

3 SEND THE COMPLETED CLAIM FORM TO DAN

DAN Claims,
Private Bag X197,
Halfway House 1685
Fax: 086 511 3698 or +27 11 312 0054
Email: claims@dansa.org or helia@dansa.org

4 SIT BACK AND BE ASSURED THAT DAN IS TAKING CARE OF EVERYTHING

For most people the mere mention of the word “claim” conjures up all sorts of nightmares, depending on past experience with insurance companies. For all, though, the prospect of having to work through the administrative process of filing a claim is rather off-putting! But DAN ensures that a claim made through them is a hassle-free process – all you have to do is follow these four easy steps...

DAN is neither an insurance nor an insurance company. DAN is insured under a group policy by AIG South Africa. We extend the benefits to our members. Therefore, we are actually claiming from AIG on your behalf and the documentation you send to us, allows us to do so. By doing this, the steps from your side are actually simpler.

STEP 1 - CALL DAN

In the event of an emergency, always call DAN, even if you believe the injury is not serious. Most importantly, we would like to make sure you get the best possible care. Secondly, the call serves as a verification of the date, time and nature of the illness or injury. Then last but not least, calling the DAN hotline is essential to activate and confirm that the benefits of your DAN membership cover the particular illness, injury and the treatment you need.

From inside SA call TOLL FREE:

0800 020 111 – save this number on your cell phone. From outside SA call:

+27 828 10 60 10 – save this number on your cell phone when travelling abroad.

The DAN hotline will make all the necessary arrangements for your treatment and issue Guarantees of Payment (GOPs) to the service providers, hospitals or health care professionals. If, for the sake of simplicity, you choose to pay, DAN can verify that the service you need to pay for is eligible as a claim.

Please remember: DAN membership is a secondary cover. Most countries, including South Africa, have strict legislation defining the responsibilities of medical insurance vs travel insurance. Within South Africa, and within most other countries of residence, any medical

treatment is primarily charged to medical aid. DAN cover is only activated for:

- (1) those listed services that are not provided by medical aids within your country of residence (e.g. recreational diving-related injuries) and
- (2) specific travel, diving-related and emergency medical conditions when travelling abroad.

This judicious use of DAN membership benefits also allows us to keep our membership fees low. Therefore, please tell the operator at the DAN hotline if you have a medical aid. If appropriate, they will arrange that hospital admission and other covered procedures are billed to your medical aid. Any expenses not covered by your medical aid or any expenses that you may have to pay from your own pocket (payments from your Medical Savings Account do not qualify) can then be covered by DAN.

STEP 2 – FILL IN A CLAIM FORM

Usually DAN will contact you, the member, first. Once a call has been made to the DAN hotline that could result in a claim, the DAN office will be alerted of the potential claim. We will then contact you and ask you to fill in a claim form (a simple two-page form).

If you have a claim to file and have not contacted the DAN hotline, you will need to do so first. To contact the DAN office to alert us of your claim, call DAN on **0860 242 242**, or if calling from outside SA, call us on **+27 11 312 0512**.

If all the arrangements were made via the DAN hotline and there is no medical aid involved, Guarantee of Payments (GOPs) would have been issued directly to the service providers. These GOPs give the service

providers instructions to bill DAN directly and we arrange payment from AIG without needing any input from you, other than possibly verifying the services received if there is any uncertainty.

STEP 3 – SEND THE COMPLETED CLAIM FORM TO DAN

Once you have completed the claim form, return it to DAN together with any relevant supporting documentation. This includes any receipts that you wish to claim. These documents can be faxed, emailed or hand-delivered to the DAN office.

In the case of faxed or emailed documents (which allows us to start processing immediately), please also mail or hand-deliver the originals. Please see the relevant contact details below.

**DAN Claims,
Private Bag X197,
Halfway House 1685
Fax: 086 511 3698 or +27 11 312 0054
Email: claims@dansa.org or helia@dansa.org**

STEP 4 – SIT BACK AND BE ASSURED THAT DAN IS TAKING CARE OF EVERYTHING

DAN will pay all the bills for covered services and reconcile any short payments with service providers as well as arrange any reimbursements due to you.

Please remember that DAN is the group policy holder with our underwriter AIG South

Africa. We claim from them! DAN members are automatically covered through the policy DAN holds with AIG. DAN is not a broker and we do not sell insurance to our members – a common misconception. Members cannot claim from AIG directly.

Once all the bills have been settled and the claim has been finalised on DAN's side, we will send you a final reconciliation so that you can see what the total pay-out is. **AD**

TESTIMONIALS

A few testimonials from members that have had to claim before:

"I was part of a diving group that was diving in the Red Sea, Egypt and staying on a liveaboard boat. I fell and this resulted in a severe pain in my lower ribcage. After calling the DAN hotline, I was given advice on what to do and sought medical treatment. Upon my arrival back home and after being advised by the personnel of DAN-SA, all my expenses were paid back to me by DAN. My sincere thanks to Dr Morris, Helia, Dawn, Lana and Phillip for their professional service, expert advice and concern for my well-being." – Anton

"Thank you for your quick response in line with the assistance we have received from you to date." – Marilyn

"Thank you very much for sorting out the medical bills. It is much appreciated!" – Megan

IMPORTANT POINTS TO REMEMBER

- We need a completed claim form from you in order to file a claim. These can be downloaded at www.dansa.org under downloads or obtained from the DAN office.
- You need to call the DAN hotline in the event of an injury/accident or incident that might require treatment.
- We need to (by law) first attempt to claim from your medical aid or any other insurance you may have.
- If you receive any bills directly, you need to forward these to DAN.
- Keep your DAN membership up-to-date; it remains the member's responsibility to ensure their membership fees are paid up.
- Notify DAN if you are travelling outside your country of residence for more than 90 days at a time.

Epilepsy and Diving

DAN explains why it is not a good idea to combine the two

By Dr Frans J Cronjé

Q We have a boy in our class who is eager to dive but has an old history of epilepsy. This period was confined to a 12-month duration (1998-1999). His doctor had completed a dive medical examination, and the prospective diver says he hasn't had a seizure since 1999, has since gotten his driver's licence back and hasn't had to take any drugs since 2001.

The doctor seems confident that he is back to full health, but the young man would like confirmation that, despite his doctor's notes, he is okay to dive. Can you give us any advice on this? I'm assuming that since his doctor has cleared him for diving and he has a driver's licence, he should be alright to dive, but, if possible, I'd like to get a second opinion from you.

Many thanks for your time and help.

DAN member

A The issue of epilepsy and scuba diving is a complicated one. The primary concern is that a loss of consciousness underwater is likely to result in death by drowning unless, by a turn of good fortune, the individual:

- does not lose the demand valve (regulator);
- is discovered before drowning;
- does not breath-hold during ascent with a rescue attempt as a result of laryngospasm or an inability to exhale;
- receives effective resuscitation immediately at the surface;
- does not go into cardiac arrest.

Unfortunately, this is not always the case. The death rate due to unconsciousness underwater is between 30 and 70%. In the case of an underwater seizure, it may be even higher.

Diving induces many of the stimuli known to independently precipitate an epileptic seizure, such as flickering lights, hyper- or hypoventilation and sensory deprivation. So if there is even a marginal risk for seizures, this may be increased even further by diving.

Finally, even though an individual has not had epilepsy for a number of years or after a certain age, statistics still indicate that the probability of another convulsion is greater than in the rest of the "normal" diving population (believed to be less than 1%). However, certain training associations, such as the British Sub-Aqua Club, accept medical clearance for individuals who have been seizure-free (on no medication) for five years, or after three years if the last seizure occurred during sleep only. This stance on the matter, made by their medical advisory panel, is based on the fact that the chances of developing another seizure decrease exponentially over time and the diver could approach near normal levels after five years. Ultimately, it is up to the diver to decide. Diving physicians are typically very reticent to encourage a diver, with a known risk factor, to face an elevated but unquantified risk for which the adverse outcome is likely to be fatal.

In short, there are two positions on epilepsy and diving:

A) Most diving physicians are of the opinion that unless the seizures or loss of consciousness was due to:

- (1) fainting with ultimate seizure activity due to remaining upright in the presence of low blood flow to the brain;

(2) other causes of acute low blood pressure, low blood sugar, medication or recreational drugs; or

(3) fever, but not after the age of five, they would not feel confident about advising a person with a confirmed diagnosis of epilepsy that it would be safe to dive.

B) On the other hand, there is scientific support that individuals who have been free of seizures, without medication, are unlikely to have further seizures after a period of five years¹⁻⁵.

For the moment, on both counts, it seems that the prospective diver would not be considered fit to dive. After five years, we may again be faced with this question... **AD**

EPILEPSY

THE ADVICE IS STILL THE SAME: This disorder of brain function causes episodic alterations of consciousness, called epileptic seizures. Abnormal electrical discharges in the brain cause these episodes which may occur without warning, and they may vary in character from a brief loss of attention to violent, prolonged convulsion. People may outgrow the condition. It is often, but not always, controlled by medication.

FITNESS AND DIVING: Loss of consciousness or loss of awareness while underwater carries a high risk of life-threatening injury. Current doctrine among diving medicine physicians advises that individuals with epilepsy not dive. Those with childhood epilepsy, who have outgrown the condition and have been off medication for five years, still face a slightly increased risk of a seizure. To make an informed decision about diving, these individuals should discuss this with their personal physicians, families and diving companions.

MEDICATION USED IN TREATMENT: Anti-seizure medication acts directly on the brain and may interact with high partial pressures of nitrogen. This may produce unexpected side effects.

HISTORY OF SEIZURES WITHOUT A CLEAR DIAGNOSIS OF EPILEPSY: This is a cloudy question since many variables can cause transient alteration of consciousness. These alterations of consciousness include fainting, a reduction of blood pressure (very common in young people), an alteration in heart rhythm (more common in older people) and the effects of medication and psychological events, such as hallucinations.

CONCLUSION: Any loss of consciousness underwater is likely to have a bad outcome. When diving using nitrox or mixed gas as a breathing gas, increased partial pressures of oxygen can increase the likelihood of seizures. Increased carbon dioxide may also increase seizure risk.

The best advice is to get a precise diagnosis of the cause of altered states of consciousness; effective treatment is often available. You cannot make a reasonable decision to dive until this is sorted out. It may take some time and a visit to a neurologist or another specialist. It is always wise to ask your doctor first.

An excerpt from the May/June 1999 issue of Alert Diver: "CNS Considerations in Scuba Diving: How Your Diving Fitness Can Be Affected By Your Central Nervous System Health," By Dr. Hugh Greer, DAN Southwest Regional Co-ordinator.

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Diving Emergency Specialist

DAN has created a recognition programme called Diving Emergency Specialist (DES). The DES designation is a way to commend divers who have sought out the training they need in order to be prepared buddies and safer divers.

To earn this recognition, divers must hold current certifications in:

- Oxygen First Aid for Scuba Diving Injuries (or equivalent)

Plus three of the following:

- Advanced Oxygen First Aid for Scuba Diving Injuries (or equivalent)
- First Aid for Hazardous Marine Life Injuries (or equivalent)
- AEDs for Scuba Diving (or equivalent)
- On-Site Neurological Assessment for Divers (or equivalent)
- Remote Emergency Medical Oxygen (REMO2™)

The Diving Emergency Management Provider Course would qualify as it consists of Oxygen First Aid for Scuba Diving Injuries, Advanced Oxygen First Aid for Scuba Diving Injuries, First Aid for Hazardous Marine Life Injuries and AEDs for Scuba Diving.

You must also hold:

- a rescue-level certification or higher
- current CPR and first aid certifications



This programme is open to any diver.

To receive this recognition, submit your application directly to DAN Training with photocopies of all the required certifications and the application fee.

DES recognition includes a:

- DES certification card
- DES certificate
- DES shoulder patch

For more information contact DAN Training on 0860 242 242 or training@dansa.org

 **DAN**[®]
SOUTHERN AFRICA

DAN Training & Education

By Helia van Zyl

Continuing education is an important way for divers to continue to hone their diving skills and improve as divers. Divers Alert Network understands the importance of being an active and involved diver who takes the time to learn about not just new dive techniques, but techniques to care for yourself and others injured in a dive accident.

Entry-level courses



OXYGEN FIRST AID FOR SCUBA DIVING INJURIES

As a recreational diver, you can receive training to provide vital first aid that can make a difference to a scuba diver with decompression illness. The DAN Oxygen Provider Course provides entry-level training in the recognition and management of possible diving-related injuries using emergency oxygen first aid.

DAN's Oxygen First Aid for Scuba Diving Injuries Provider Course was designed to fill the void in oxygen first aid training available for the general diving public.

This course represents entry level training designed to educate the general diving (and qualified non-diving) public in recognising possible dive related injuries and providing emergency oxygen first aid while activating the local emergency medical services (EMS) and/or arranging for evacuation to the nearest available medical facility.

In DAN's most recent dive accident record, less than 33% of injured divers received emergency oxygen in the field. Few of those received oxygen concentrations approaching the recommended 100%. DAN and all major diving instructional agencies recommend that all divers be qualified to provide 100% oxygen in the field to those injured in a dive accident.



OXYGEN FIRST AID FOR AQUATIC EMERGENCIES

This course trains non-divers and professional rescuers (such as lifeguards) to recognise near-drowning/submersion incidents and other aquatic medical emergencies and to provide basic life support including the use of oxygen first aid.

Every year more than 4 000 Americans die from drowning and many more suffer from near-drowning events.

According to the 1998 National Sporting Goods Association (NSGA) annual sports participation survey, 58,2 million Americans participated more than once in swimming during the year. The same study identified nearly 30 million people who participated in power boating, sailing, kayaking, rafting or canoeing.

When swimmers and boaters have near-drowning accidents, water in their lungs keeps their lungs from working properly and as a result they don't get an adequate amount

of oxygen. This may cause secondary drowning. Victims appear to survive an incident only to die at home a few hours later. Administering 100% oxygen first aid immediately after an accident improves the victim's survival chances.

For nearly a decade, DAN has preached the benefits of providing oxygen to injured scuba divers. During that time more than 80 000 people worldwide have been trained in this first aid skill. In March of 1999, DAN launched the Oxygen First Aid for Aquatic Emergencies (Aquatics) Programme. Its goal is to extend the life-saving skills of oxygen first aid to people who live and play in and around water. Providing high concentrations of oxygen to near-drowning victims in the first few minutes after rescue can prevent serious or even fatal complications.



FIRST AID FOR HAZARDOUS MARINE LIFE INJURIES

Serious hazardous marine life injuries are rare, but most divers experience minor discomfort from unintentional encounters with fire coral, jellyfish and other marine creatures. This course teaches divers to minimise these injuries and reduce diver discomfort and pain.

The First Aid for Hazardous Marine Life Injuries Programme is designed to provide knowledge regarding specific types of marine creature injuries as well as general first aid treatment for those injuries.



AUTOMATED EXTERNAL DEFIBRILLATORS FOR SCUBA DIVING

More than 30% of all dive fatalities are actually caused by cardiovascular disease, according to DAN dive accident and fatality statistics.

This course teaches divers and other interested parties to provide care for sudden cardiac arrest including the use of an Automated External Defibrillator (AEDs).

This course represents entry-level training designed to educate the general diving (and qualified non-diving) public to better recognise the warning signs of sudden cardiac arrest and administer first aid using basic life support techniques and automated external defibrillators while activating the local Emergency Medical Services (EMS) and/or arranging for evacuation to the nearest appropriate medical facility.

- The mean age of divers who die each year in dive fatalities tracked by DAN is gradually increasing. It is now approximately 42 years of age. Divers are getting older and older people are getting involved in diving.
- Of the 78 dive fatalities in the DAN 2001 report on decompression illness, diving fatalities and project dive exploration, based on 1999 fatalities, 7.7% of them were caused directly by heart disease. At the same time, heart disease was the direct cause of death for 26% of the fatalities involving divers over the age of 35.
- On top of that, 25% of divers involved in diving fatalities were also reported to be taking heart medications.

Heart disease is a common problem. To ignore that it affects divers as much as it affects the general population does divers a disservice. When you consider that diving is often done from remote locations - on beaches or off of dive boats - that are far removed from emergency medical help, it is important to prepare for every emergency.



AUTOMATED EXTERNAL DEFIBRILLATORS FOR AQUATIC EMERGENCIES

When a person drowns, they may or may not inhale water. They normally enter cardiac arrest because of the inability to breathe. This course teaches interested parties to provide care for cardiac arrest by using an Automated External Defibrillator (AED).



DIVE ACCIDENT FIRST AID FOR NON-DIVERS

This programme is designed for non-divers and teaches them how to recognise the warning signs of decompression illness and

help provide care for a diver involved in a dive emergency.

Often, non-divers end up having to care for divers in a dive emergency. Possible scenarios include:

- The diver's symptoms don't show up for three or four hours after a dive and they are home with a non-diving spouse.
- A diver surfaces early in a dive while the dive master is off the boat leading the dive. Only the captain or a deckhand is on board.

Understanding this, DAN has created a simplified version of its training courses with the non-diver in mind. The Dive Accident First Aid for Non-Divers Programme includes key skills from:

- Oxygen First Aid for Scuba Diving Injuries
- First Aid for Hazardous Marine Life Injuries
- Automated External Defibrillators (AEDs) for Scuba Diving

This programme is not intended for divers. It is appropriate for non-diving spouses, bubble watchers, boat captains and mates and anyone else who may have to care for a diver involved in a dive injury.

The difference between this programme and other programmes, such as the Diving Emergency Management Provider Course along with individual DAN programmes, is the content is limited to "What to look for" and "What to do about it". "Why it's happening" was left out.

Essentially, this programme includes symptom recognition and the first aid skills to provide care. In complete DAN programmes, divers also learn the effects these injuries have on their bodies and how to prevent them. This information is important for divers to help them be safer, but from a non-diver standpoint, this information is not as critical as responding to the immediate need.



Intermediate courses



BASIC LIFE SUPPORT FOR DIVE PROFESSIONALS

The remote nature of dive accidents, whether a few hours from shore or days from civilisation, frequently requires more advanced levels of care than are offered by traditional or entry-level CPR programmes. DAN instructors and instructor trainers will now be able to offer a healthcare provider-level basic life support programme for their student and divers.

Called Basic Life Support for Dive Professionals (BLSPRO), this programme is ideal for dive professionals and divers interested in understanding professional-level resuscitation techniques. This programme is designed to be applicable to the diving market, including scenes and scenarios from dive situations, as well as the non-diving/healthcare market.

Coupled with DAN's existing training programmes and the new Advanced Oxygen First Aid Programme, DAN instructors and instructor trainers will now be able to offer a complete diving emergency programme. This programme also addresses basic life support skills for adults, children and infants.

Skills learned in this programme that set it apart from lay-provider level CPR courses include:

- Two-person CPR
- Ventilation using a bag valve mask
- Finger sweep
- Suctioning
- Cricoid pressure
- The technique for caring for an unconscious choking victim



ON-SITE NEUROLOGICAL ASSESSMENT FOR DIVERS (Pre-requisite: Oxygen First Aid for Scuba Diving Injuries)

Learn how to conduct a neurological assessment on a potentially injured diver in this course. The information gained in this assessment can help convince a diver of the need for oxygen first aid, and help a dive physician determine the proper treatment.

Approximately two-thirds of divers with decompression illness have evidence of damage to the nervous system. These signs are often vague and can go unrecognised by the diver. This can cause them to be dismissed as insignificant or not dive-related.

This programme focuses on how to obtain essential information about a diver involved in a dive emergency and what information to relay to emergency medical services.

Only medical professionals should diagnose medical conditions. The information you gather while performing a neurological assessment will be useful to help the dive physician understand the extent of the injury and how it has changed in the time it took to get the diver from the dive site to definitive care.



ADVANCED OXYGEN FIRST AID FOR SCUBA DIVING INJURIES (Pre-requisite: Oxygen First Aid for Scuba Diving Injuries)

This module is an advanced-level programme that provides additional training for those individuals who have successfully completed the DAN Oxygen First Aid for Scuba Diving Injuries Course within the past year. It is designed to train

DAN Oxygen Providers to use the MTV-100 or a Bag Valve Mask (BVM) while providing care for a non-breathing injured diver and activating the local emergency medical services (EMS) and/or arranging for evacuation to the nearest available medical facility.

- Rescue breathing with supplemental oxygen delivers upwards of 50% inspired oxygen when performed correctly. However, using an MTV-100 or Bag Valve Mask with oxygen can deliver nearly 100% inspired oxygen to a non-breathing injured diver.
- When supplemental oxygen is not available, a Bag Valve Mask can deliver 21% oxygen as compared to 16% with rescue breathing without supplemental oxygen. The MTV-100 does not work without an oxygen supply.

This is not a stand-alone programme. It is intended to train current DAN Oxygen Providers to administer oxygen using advanced-level skills.

Advanced courses

Newly released in SA!



DIVE MEDICINE FOR DIVERS (Pre-requisite: DEMP and NEURO)

When you want to know more than just basic first aid techniques, Dive Medicine for Divers is your next step. Ultimately, more knowledge and a better understanding of how our bodies react to the pressures and stresses of diving leads to safer dives as we understand our limitations and the limitations of the situation.

Created as an educational programme to answer many questions divers ask, this new modular programme, Dive Medicine for Divers Level 1, includes sections on fitness to dive, safety planning and basic physical examinations.

The course includes a selection of new skills and practical applications, along with lecture topics presented by a DAN instructor trainer or instructor with the use of video

programmes and additional self-study information. The first three modules are:

- Basic Examinations – this module teaches how to evaluate a diver’s respiratory and cardiac function using a stethoscope.
- Fitness to Dive – this module discusses what it means to be physically fit enough to dive and the medical conditions that can keep divers out of the water. There is also a discussion on basic ear-clearing techniques.
- Safety Planning – this module includes processes and procedures to make your dives safer, but also discusses how to deal with the aftermath of a dive accident, including taking care of the diver’s equipment for investigation purposes and taking care of the rescuers afterwards.

Combination courses



DIVING EMERGENCY MANAGEMENT PROVIDER PROGRAMME

Learn the knowledge and skills from several courses in one single approach to dive emergency management.

It is a rare event to find that a dive emergency is due to only one single event. More often than not, separate small problems compound to create a larger problem.

Divers and dive professionals interested in understanding first aid care for dive emergencies can now take the Diving Emergency Management Provider Course from a DAN instructor. This programme integrates the knowledge and

skills from several DAN Training Programmes into a single eight-hour day. The Diving Emergency Management Provider Course includes:

- Oxygen First Aid for Scuba Diving Injuries
- First Aid for Hazardous Marine Life Injuries
- Automated External Defibrillators (AEDs) for Scuba Diving
- DAN Advanced Oxygen First Aid for Scuba Diving Injuries

After reviewing the skills and knowledge development portions of this programme, the students then participate in an integrated scenario where they get the opportunity to bring together all of the skills they learned in each of the segments into a single scenario.



Leadership programmes

INSTRUCTOR QUALIFICATION COURSE

To become a DAN instructor you must complete the DAN Instructor Qualification Course (IQC). Instructor candidates will complete a core module that offers more information about DAN and explains how to teach DAN programmes. Candidates will then complete the course module for each DAN training programme they are interested in teaching.

DAN instructors are scuba diving educators who want to offer dive safety programmes to their students.

Prerequisites for DAN Instructor Qualification Course:

- DAN Member
- Active scuba diving educator
- Current CPR instructor
- Documentation of first aid training

Prerequisites to teach the separate modules:

Oxygen First Aid for Scuba Diving Injuries

- CPR Instructor

Oxygen First Aid for Aquatic Emergencies

- CPR Instructor

Advanced Oxygen First Aid for Scuba Diving Injuries

- Oxygen First Aid for Scuba Diving Injuries Instructor

First Aid for Hazardous Marine Life Injuries

- CPR Instructor

Automated External Defibrillators for Scuba Diving

- CPR Instructor

Automated External Defibrillators for Aquatic Emergencies

- Automated External Defibrillators for Scuba Diving Instructor

Basic Life Support for Dive Professionals

- CPR Training

On-Site Neurological Assessment for Divers

- Oxygen First Aid for Scuba Diving Injuries Instructor

Dive Accident First Aid for Non-Divers

To offer this programme, DAN instructor trainers and instructors must be in active teaching status for:

- Oxygen First Aid for Scuba Diving Injuries
- First Aid for Hazardous Marine Life Injuries
- Automated External Defibrillators (AEDs) for Scuba Diving

Diving Emergency Management Provider

To offer this programme, DAN instructor trainers and instructors must be in active teaching status for:

- Oxygen First Aid for Scuba Diving Injuries
- First Aid for Hazardous Marine Life Injuries
- Automated External Defibrillators (AEDs) for Scuba Diving
- Advanced Oxygen First Aid for Scuba Diving Injuries

INSTRUCTOR TRAINER WORKSHOP

This programme teaches scuba diving instructor trainers to teach the DAN Instructor Qualification Course and train DAN instructors. Only DAN staff members and examiners can offer this programme.

DAN instructor trainers have achieved the highest level of training available in the DAN instructional system. They are exceptionally experienced instructors who are dedicated to dive safety education. DAN instructor trainers are the only individuals certified to train DAN instructors as part of the DAN Instructor Qualification Course.

After completing a DAN Instructor Trainer Workshop, DAN instructor trainers can present the knowledge and skills development sessions of the core module to the various course modules of the IQC. To become a DAN instructor trainer, the instructor trainer must:

- Be a certified and active scuba diving course director or instructor trainer
- Be a cardiopulmonary resuscitation (CPR) instructor
- Have documentation of first aid training
- Be a current DAN member



Specialty programmes

CHAMBER ATTENDANT'S COURSE (CHATT)

This programme is provided to persons involved in chamber operations and qualifies the individual to attend to a fellow diver inside a multiplace hyperbaric chamber. The prerequisites for entry into this programme include the following programmes:

- Basic Life Support for Dive Professionals
- On-site Neurological Assessment for Divers

After successful completion of the programme, the person would be able to work effectively at a hyperbaric unit treating divers.

CHAMBER OPERATOR'S COURSE (CHOP)

This programme teaches the individual to operate hyperbaric chambers and provide hyperbaric oxygen therapy to injured divers. For entry into this programme, the individual must have successfully completed the CHATT programme, but also have a thorough knowledge of diving tables. Usually only instructor-level persons are allowed entry.

Contact a DAN instructor in your region to take any of these courses. A full list of instructors is available from DAN-SA on 0860 242 242 or www.dansa.org under "training".



Diving with Ear Problems: Practical advice

By Dr Frans J Cronjé

Of all the potential problems that affect divers, ear and sinus problems are not only the most common, but also most likely to keep divers out of the water – for many the grimmest prognosis of all... This article offers an overview on the most common diving maladies related to the ears and offers some practical advice on how to prevent and manage problems if they occur.

The significant changes in pressure encountered during diving cause large pressure-volume shifts in the airspaces of the body. For some, such as the intestines, these changes are usually insignificant. For others, such as the ears, sinuses, face mask and lungs, these changes may be hazardous unless deliberate measures are taken by the diver to prevent problems. Much of diver training is focussed on teaching divers these measures.

Unfortunately technical issues are not the only consideration. Upper respiratory tract infections, scarring from previous infections or surgery and anatomical abnormalities may all complicate the ability to adjust pressure in the ears and sinuses. In addition, immersion and exposure to cold water may have potentially adverse effects on the ears.

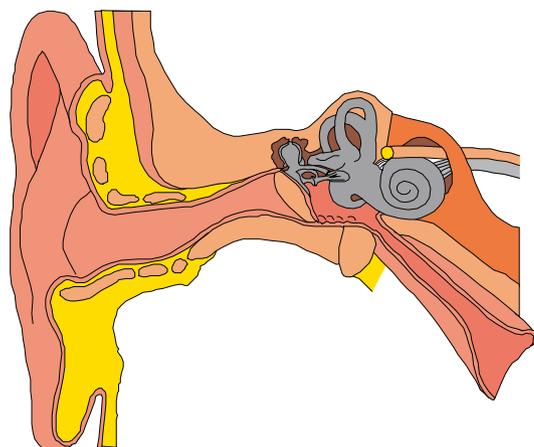
Diving-related problems of the ear fall into two categories: (1) exposure to water and (2) exposure to pressure.

Water affects the quality of hearing and our ability to localise sound. Immersion also exposes the external ear to water with the risk of maceration (water-logging of the skin) infection. Cold water exposure may cause dizziness due to stimulation of the inner ear. Over time, chronic exposure to cold water (i.e. less than 20°C) results in exostoses (i.e. bony outgrowths in the external ear).

Pressure, on the other hand, may result in trauma called barotrauma, ear squeeze (during

descent) or reverse blocks (during ascent). It may also lead to the absorption of inert gas (i.e. nitrogen) with a potential risk of developing decompression sickness. Dizziness, or more specifically vertigo (i.e. a false sense of spinning) may occur during descent due to rupture of the ear drum with the entry of cold water into the middle ear, nitrogen narcosis, pressure on the ear drum being transferred to the inner ear (i.e. alternobaric vertigo), or high pressure nervous syndrome when divers dive deeper than approximately 150 m.

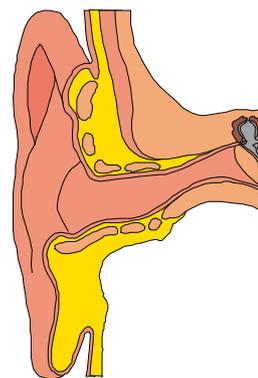
As problems of infection and barotrauma are the most common, and also primarily affect recreational divers, this article will discuss these conditions.



ANATOMY AND PHYSIOLOGY

The ear consists of three parts: the external ear – a partly cartilaginous and partly bony canal lined with skin, which is exposed to water during diving; the middle ear – an isolated gas space through which sound waves are conducted to the inner ear and which communicates to the outside world via the Eustachian tube; and the inner ear – where sound waves and balance stimuli are converted into electrical impulses and conducted to the brain. Each portion of the ear has its own unique features and problems which are described hereafter.

THE EXTERNAL EAR



The external ear begins with the visible auricular appendage called the pinna which also contains a fleshy protective lump, called the tragus. This tell-tale spot provides a valuable clue for identifying external ear infections (it becomes tender to the touch).

The external opening

to the ear canal leads upwards, backwards and inwards towards the ear drum. The skin over the external part of the ear contains hair

and modified sweat glands that produce the cerumen or ear wax. This wax is a natural barrier to water and infection and it is removed by continuous soaking during diving. Beyond the outer third of the ear follows an area of skin with no hairs and no wax glands. This smooth skin overlies bone and is very thin, very fragile and very painful if infected or traumatised. This external ear canal ends at the ear drum – a pearly white, semi-translucent structure that is as thin as tissue paper, but surprisingly strong.

Bony outgrowths: Exostoses

Divers and swimmers, especially those who spend a lot of time in cold water, sometimes develop bony outgrowths into the ear canal called exostoses. Theory has it that cold water irritates or damages the underlying bone resulting in subsequent gradual overgrowth of bone. These bony outgrowths are not troublesome as such but can eventually impair the natural removal of wax, water and debris from the ear, or lead to a block of the canal. If this happens, surgery may be needed.

Swimmer's ear: Otitis externa

The most common problem with the external ear, and the second most common problem in divers, is otitis externa or swimmer's ear. It is the result of a combination of factors including the loss of protective ear wax, water-logging of the skin, colonisation by water-loving bacteria or fungi and sometimes additional trauma from divers using cotton buds or other foreign objects to dry or scratch an "itching" ear. The most important preventative strategy is to not fiddle with the ears and, for those who get these infections regularly, to replace the anti-bacterial effect of natural ear wax with an artificial one. Traditionally various preparations have been used that contain vinegar (acetic acid). A combination of acetic acid/aluminium acetate/sodium acetate is marketed as Domeboro® which is quite effective in preventing ear infections. Once an infection starts, however, a combination of antibiotics and anti-inflammatory medication is usually required on prescription. Ear ache due to external otitis can be severe and once the ear canal has swollen shut it becomes more difficult to treat. Needless to say it can ruin a diving trip so obtain medical assistance early, don't delay. Another preventative measure for people struggling with persistent external ear infections is the ProEar® mask (<http://www.proear2000.com/>) which cups the ears in a way similar to a face mask and is connected to the mask to allow equalising of the cups through two reinforced tubes. This mask keeps the ears dry but ear equalising is still required.

External ear barotrauma

Pressure damage of the external ear can result when a diver wears ear plugs, when a tight fitting hood traps air in the external ear canal,



BONY OUTGROWTHS: EXOSTOSES

Cause: **Mainly cold water.**

Effect: **Can impair the natural removal of wax and water debris. Can result in a blocked canal.**

Solution: **If troublesome, surgery may be needed.**



SWIMMER'S EAR: OTITIS EXTERNA

Causes: **Loss of protective ear wax, water-logging of the skin, colonisation by water-loving bacteria or fungi, and sometimes additional trauma from divers using cotton buds or other foreign objects to dry or scratch an "itching" ear.**

Effect: **Infection, inflammation of the external ear and ear ache.**

Solution: **Do not fiddle with the ear. For those who get these infections regularly, replace the anti-bacterial effect of natural ear wax with an artificial one. The ProEar® mask.**



EXTERNAL EAR BAROTRAUMA

Causes: Can result when a diver wears ear plugs, when a tight fitting hood traps air in the external ear canal or when the ear is completely blocked by wax.

Effect: Pressure damage to the external ear – after ache.

Solution: Treatment of the after ache with simple analgesics is usually sufficient. Don't dive with ear plugs! A specialised ear plug, Proplug, permits pressure equalisation while diving and keeps the ear relatively dry.



MIDDLE EAR BAROTRAUMA

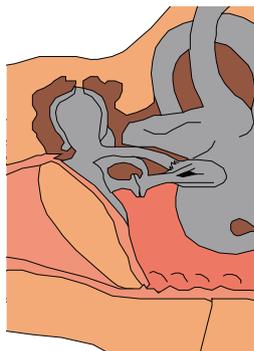
Causes: When equalising is still unsuccessful at 6 to 33 fsw (2 to 10 MSW) pressure.

Effect: The eardrum will usually rupture. There is usually significant deafness upon return to the surface, followed by severe pain some two to five hours later due to an inflammatory response to the water. There could even be gradual tearing and bleeding within and behind the ear drum.

Solution: Treatment by a medical professional. Nasal and oral decongestants are invariably prescribed in an effort to normalise Eustachian tube function.

or when the ear is completely blocked by wax. As the volume of gas decreases due to Boyle's law, the eardrum starts to bulge into the canal and the ear plug may be forced deeper into the canal. Attempts at ear equalising will only make matters worse. Fortunately it is rare for the ear drum to rupture in this way and treatment of the after ache with simple analgesics (painkillers) is usually sufficient. Don't dive with ear plugs. Having said that, there is a fenestrated (pierced with one or more openings) ear plug known as Doc's Proplugs (<http://www.proplugs.com/>) that permits pressure equalisation while diving and keeps the ear relatively dry. Although no large scale research has been conducted, an observational study of 1 000 dives by the Sardinian Institute of Underwater and Hyperbaric Medicine in 2005 was very positive. At least 55 000 divers use these devices regularly with no reported adverse events. Our limited experience has been equally favourable. Some divers seem to also find ear equalising easier.

THE MIDDLE EAR



The middle ear starts at the inner side of the ear drum. It contains three miniature bones – the malleus (hammer), the incus (anvil) and the stapes (stirrup) – that form a chain that amplifies sound waves from the ear drum to the inner ear. The middle

ear communicates with the outside world via a partially collapsed tube called the Eustachian tube. This tube allows oxygen to be replaced as it is continually absorbed by the mucus lining of the middle ear. The tube also permits pressure equilibration during changes in atmospheric pressure while diving or with altitude changes. When the diver equalises, air is driven from the back of throat through this tube into the middle ear. Because the space is semi-closed, there is a constant tendency to form a vacuum. The vacuum is usually broken (i.e. equalising occurs) by yawning, swallowing or chewing.

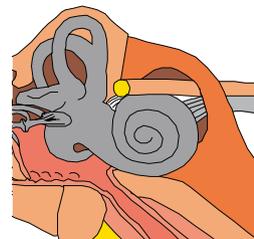
Most people can sense a pressure equivalent of about 30 cm of water on the ear drum. However, if a diver descends more than three feet, the increased pressure collapses the Eustachian tube, and it is no longer possible to equalise, even with a forceful attempt. This is similar to trying to blow through a kinked straw. It can't be done. It needs to be "unkinked" first.

Middle ear barotrauma

Approximately 65% of all divers will suffer from this malady at some stage during their years of diving. Diving to a depth of as little as 3 to 6 fsw (1 to 2 MSW) without equalising will

already cause some degree of barotrauma. If equalising is still unsuccessful at 6 to 33 fsw (2 to 10 MSW), the eardrum will usually rupture. Divers who have experienced ear drum rupture describe momentary relief of pain as the tension on the ear drum is relieved. This is followed by an episode of extreme dizziness as cold water rushes in and irritates the inner ear. As the water warms to body temperature the dizziness settles and divers may believe that their equalising problems are over. With water now filling the middle ear space, there is no further need to equalise the affected ear. However, there is usually significant deafness upon return to the surface, followed by severe pain some 2-5 hours later due to an inflammatory response to the water. Between minor irritation and a perforation of the ear drum lies a spectrum of gradual tearing and bleeding within and behind the ear drum. Such middle ear barotrauma should be treated by a medical professional. Nasal and systemic (oral) decongestants are invariably prescribed in an effort to normalise Eustachian tube function – the key to a healthy middle ear. Return to diving should be delayed until pain has disappeared, all signs of damage have resolved, any perforations have closed and healed and the ability to equalise with ease has returned.

THE INNER EAR



The inner ear consists of a complex of tubes and nerve endings that offer a mechanical-electrical interface for sound and balance stimuli. It is organised into the cochlea for

hearing and the vestibular system for balance. Unless exposed to high levels of noise, the cochlea is usually unaffected by recreational diving. However, there is a risk of barotrauma to the inner ear which may have permanent consequences. For these reasons divers are told never to force their ears to equalise. The vestibular system provides signals for orientation. On land, the eyes and joints offer additional sensory input, but under water, vision and gravity are reduced so that the vestibular system becomes vital for orientation. Disorientation, vertigo and motion sickness are all related to the vestibular system but fall outside the scope of this article. We would like to concentrate on the pressure-related effects on the inner ear and barotrauma in particular.

Inner ear barotrauma

Strenuous or prolonged attempts at middle ear equilibrium, particularly when using forceful Valsalva's manoeuvres, may elevate pressure inside the skull and inner ear to such an extent

that it causes rupture of inner ear structures. Vertigo that starts during descent is particularly suspicious when accompanied by difficulty equalising. If the vertigo is ongoing and is accompanied by any of the following, medical attention is urgent: intense ringing in the ears, a sensation of fullness in the ear, deafness, nausea and vomiting, loss of balance and jerky eye movements (i.e. nystagmus).

Inner ear decompression illness may present in a similar way, but is quite rare. It usually occurs during or after ascent and is usually associated with deep or technical dives involving the use of helium.

The treatment of inner ear barotrauma is bed rest with the head elevated to reduce intra-cerebral pressure. The diver must be evaluated with an audiogram (for the cochlea) and an electronystagmogram (for the vestibular

system) and must receive a full ENT and neurological evaluation. Symptoms often resolve spontaneously within two to three days. Surgical measures should only be considered for persistent round and oval window leaks, when there is a delay in recovery or when there is progressive deterioration in hearing or balance function.

A FINAL NOTE

Diving is a safe sport that exerts significant pressure on the structures of the ear. With proper care, training and the avoidance of discomfort or pain, injury is unlikely or minimal. Without proper attention, permanent deafness may result and surgery may be required for ruptures of the ear drum or inner ear. Diving with a head cold is inadvisable. Never force the ears and equalise early and often. ^AD

INNER EAR BAROTRAUMA

Causes: **Strenuous or prolonged attempts at middle ear equilibrium.**

Effect: **Rupture of inner ear structure.**

Note: **Upon descent, if vertigo is experienced, is ongoing and is accompanied by any of the following, medical attention is urgent: intense ringing in the ears; a sensation of fullness in the ear; deafness; nausea and vomiting; loss of balance; and jerky eye movements (i.e. Nystagmus).**

Solution: **Bed rest with the head elevated to reduce intra-cerebral pressure. The diver must be evaluated with an audiogram (for the cochlea), an electronystagmogram (for the vestibular system) and receive a full ENT and neurological evaluation.**

Ear equalising techniques

Active ear equalising is not a natural activity for humans. Many people are actually “scared” of their ears. They describe the fullness of equalising as uncomfortable or even painful. Frequently, painful memories of childhood ear infections add to this fear. Such individuals are likely to equalise very slowly and carefully, ineffectively or not at all. The confusion surrounding ear equalisation is compounded by the fact that it is difficult to describe how hard to blow (Valsalva technique) and what “successful” ear equalising feels (or sounds) like. Divers should also be told specifically never to Valsalva during ascent as this constitutes “breathholding”. Instructors should bear in mind that divers that are particularly squeamish about their ears, may not only have problems equalising, but may also be more prone to panic underwater.

There are many techniques for equalising the middle ear to ambient pressure. Only the most common and useful ones have been listed to provide divers with a number of options, as some people may respond better to one particular technique than to others. They include:

- Swallowing or yawning
- Voluntary Eustachian tube opening (beance tubaire volontaire - BTV)
- Valsalva
- Toynbee
- Frenzel
- Twitching techniques

Swallowing and yawning: These are the natural ways in which the middle ear is equilibrated. Middle ear infections in childhood are largely the result of failure of these normal mechanisms. Even in sleep, equalising occurs

approximately every five minutes through swallowing, while it occurs every minute while awake.

BTV: Some individuals have the knack of opening their Eustachian tubes voluntarily by a kind of twitch in the throat or an invisible yawn. Many professional divers eventually master this technique.

Valsalva: Perhaps the most popular equalising method is the technique described by Antonio Maria Valsalva in 1704. It involves blowing against a pinched, blocked nose so that air is forced up the Eustachian tubes, thereby equalising the middle ear. It can unfortunately be performed too forcefully, leading to inner ear problems. Therefore, the safest recommendation to divers is to blow harder than it would take to inflate a large balloon and to never perform an uninterrupted attempt of more than five seconds.

Toynbee: Joseph Toynbee described a technique of pinching the nose and swallowing simultaneously. The action of the soft palate and adjacent muscles then opens the Eustachian tube while a pressure wave in the nasopharynx moves air in and out of the middle ear. As a result, this is a very sensitive test for Eustachian tube dysfunction as only small pressures are involved.

Frenzel: A German flight surgeon, Herman Frenzel, described a technique for the benefit of Stuka pilots in WWII. It involves moving the tongue backwards quickly against the soft palate, thereby creating a pressure wave as well as positioning the muscles for easy equalisation. The technique is even better when combined with pinching of the nose. The best way to teach this technique is to have the subject say

“
Active ear equalising is not a natural activity for humans.”

”

EQUALISING TECHNIQUES



TWITCHING



HEAD TILTING



EDMONDS



LOWRY

“kick” in the back of the throat while pinching the nose. It is a very gentle and therefore a very safe technique. People who struggle with the Valsalva technique often find that this technique works for them.

Twitching: This is a good technique to get people started who are unfamiliar with equalising. While pinching the nose, the subject swiftly turns the head to the side. The ear facing forward generally equalises. The technique can be repeated for the other ear.

Head tilting: This technique corrects asynchronous equalising. Many divers find that one ear is more difficult to equalise than the other. The head is tilted sideways from the neck (so as to point the “bad ear” upwards) while keeping the shoulders horizontal. This stretches the folds around the Eustachian and straightens it, making equalising easier.

Edmonds: This technique exploits the effect of jutting the jaw forward. Again, this manoeuvre tends to open the Eustachian tube, and should be combined with other conventional equalising techniques.

Lowry: Another combination technique described by Christopher Lowry may be useful to improve equalising in general. It involves pinching the nose and blowing against a blocked nose while swallowing simultaneously. Although this is impractical to do with a regulator in place, it can assist with the discovery and improvement of equalising techniques.

Otovent®: A product distributed by Invotec International (<http://www.invotec.net/otovent.html>). The Otovent has been promoted for the prevention and treatment of otitis by treating negative ear pressure caused by Eustachian tube dysfunction. This device, made up of a nozzle and a balloon, is very useful to train novice divers about the correct amount of pressure required to equalise. It also verifies effective attempts at auto inflation. Regular practice with the Otovent® may improve the ability to equalise.

In addition to equalising techniques, several known factors may compromise Eustachian tube function and should be avoided or treated. Many people display a low-grade allergy towards dairy products. Avoidance of all dairy products two days prior to diving often provides significant relief. Some people have very sensitive nasal linings. These are the people who, for instance, tend to sneeze when their feet are in contact with a cold surface. Preventative use of nasal decongestants with diving may be appropriate for this group of individuals. Physical obstructions are not uncommon in the nose and may include fleshy outgrowths called polyps or a skew nasal septum. Corrective surgery is a legitimate and effective remedy for these

conditions. Inflammation of the nasal passages also clearly compromises the ability to equalise. Smoking and head colds prevent effective drainage of mucus from the sinuses and may predispose to ear and sinus barotrauma.

It should also be remembered that the ears are really a “safety net” for the lungs: Blockage of the nasal passages and ears is not an isolated phenomenon. Frequently there is some blockage and inflammation in the airways of the lungs as well. However, whereas blockage of the ears will only result in pain during diving, blockage of the airways may present fatal complications.

Finally, chronic use of nasal decongestants may result in the rebound congestion that will make equalising problems worse. The two most commonly prescribed medications for equalising problems or middle ear barotrauma are pseudoephedrine tablets and oxymetazoline nasal spray. Both are chemical relatives of adrenaline (epinephrine) and narrow blood vessels to reduce engorgement. The use of decongestants for the purpose of diving can only be justified if it is intended to improve an existing ability to equalise, not to make it possible, and even then it should be taken with caution and for no more than five days. Prolonged use causes rhinitis medicamentosa, a chronic stuffy, running nose that is unresponsive to decongestion.

Finally, divers should know how to preserve and protect their ears. Upon discovering any equalising problem or ear pain, further descent should be stopped immediately. The diver should then ascend 3 to 6 fsw (1 to 2 MSW) to reverse the locked-blocked situation. Various techniques for ear equalising may then be attempted, bearing in mind that the ear should never be forced, and no attempt at blowing should exceed five seconds. If all these measures fail, the dive should be ended.





DAN DIVING SAFETY PARTNERS PROGRAMME

By Morne Christou

The DAN Diving Safety Partners (DSP) Programme is a diving safety initiative through which DAN offers recognition to participating dive operators and resorts for their commitment to safe diving practices and emergency preparedness.

The programme was started by DAN America as Partners in Diving Safety, but ran into difficulties due to the belief that endorsing the safety of diving operations would incur liability for DAN. DAN-SA has taken a different approach: Since 2006 DAN-SA has been partnering with a number of diving operations who have expressed an interest in improving the diving safety of their facilities. DAN does not police or enforce any of the diving safety principles, but rather recognises those facilities who have submitted reasonable evidence of compliance to those diving safety requirements that are generally accepted by the diving industry and diver training agencies.

The programme requires that participating dive operators demonstrate that they are appropriately equipped, staffed and trained to prevent, respond to and manage diving-related medical emergencies and lost diver situations. The operation is expected to show that it has maintained this level of preparedness on an ongoing basis; they are also required to renew their agreement annually.

Importantly, the entry level DSP Programme imposes no additional requirements to the accepted industry standards for diving safety. It simply recognises that operators have shown that they are actually applying and complying with these accepted standards.

To become a DSP, participating operators provide DAN with the following: business contact information, the training credentials of their staff (including CPR and oxygen first aid), the details of safety and first aid equipment and the particulars of their emergency assistance and lost diver prevention and retrieval plans.

Although DAN cannot be held responsible for the accuracy of the information provided, we do require reasonable proof of the above-mentioned requirements. If a facility were to misrepresent their preparedness to DAN, and

this were to become evident in a subsequent emergency, the documentation presented to DAN would serve as an indictment on the facility. Therefore, we are confident that our DSPs are actually compliant with the provisions for which the DSP recognition is offered.

With the introduction of the DSP Programme three years ago, we invited diving operations throughout our region to apply for this prestigious recognition. The response has been very gratifying. Nearly 30 diving operations have joined DAN as DSPs to date. In return, we have provided these diving operations with recognition materials, banners and flags and also made our members aware of these facilities; this has added even greater credibility and support for their operations.

The DAN DSP Programme benefits both the dive operator and diver and the reason for this is quite simple. The diver benefits by diving with operators who are committed to diving safety, and the dive operators enjoy the support that is to be expected from an operation committed to the safety of their clients. In today's competitive market it is important to always be on top of your game. By offering the best combination of service and safety, support by recreational divers is a natural result.

There are presently 28 DAN DSPs. These include various South African, Mozambican, Seychelles and Zanzibar operators. Many others are now in the process of completing their applications for the DSP Programme.

To make it even easier for dive operators to meet the minimum industry standards for staff training, DAN offers oxygen first aid and CPR training on site where needed. DAN has been travelling to Zanzibar, Seychelles and Mozambique to help train staff members in need of training by introducing the DAN training road show during 2006, 2007 and 2008. DAN also offers special discounts on oxygen and first aid equipment for DSPs and DSP applicants.

Divers can be confident that, once an operator has become a DAN DSP, they are committed and able to prevent, respond to and manage diving emergencies.

DAN would like to encourage all divers to ask their dive operators and charter boat companies to join the DSP Programme in support of diving safety in southern Africa.

For more information about the DAN DSP Programme please contact DAN-SA on 0860 242 242 or visit our website www.dansa.org

REGISTERED DSPs

SOUTH AFRICA

- Adventure Mania – Sodwana Bay
- Aliwal Dive Centre – Umkomaas
- Amoray Diving – Sodwana Bay
- Blue Vision Dive Centre – Umkomaas
- Calypso Dive & Adventure Centre – Ushaka Marine World Durban
- Coral Divers – Sodwana Bay
- Oceans Alive Diving – Umkomaas
- Sea Escapes – Sodwana Bay
- Sodwana Bay Lodge – Sodwana Bay
- Triton Dive Charters – Sodwana Bay
- Underwater Explorers – Cape Town

MOZAMBIQUE

- Barra Lodge
- Centro de Mergulho – Coconut Bay
- Jeff's Palm Resort
- Malongane Watersports

TANZANIA (INCL. ZANZIBAR)

- Bahari Divers Dive 710 - Pemba Island
- East Africa Diving
- Karafuu Dive Centre
- One Ocean The Zanzibar Dive Centre
- Zanzibar Watersports
- Mnemba Island Lodge
- Peponi Diving
- Scuba Libre
- The Crab



THE ASTHMATIC DIVER...

How does **ASTHMA** affect diving possibilities?

By DAN Medical Team

Asthma is a chronic disorder of the lungs in which there is a tendency for the muscles surrounding the bronchi (breathing tubes) to contract excessively. This causes a narrowing, or bronchoconstriction, with a resulting increase in breathing resistance, particularly during exhalation, which may manifest as wheezing, chest “tightness”, coughing or breathlessness. Learn about the effects of asthma and diving including the effects of asthma medication and diving, and how to determine if you’re fit to dive with asthma. This article is a stepping stone to help asthmatic divers try and manage this chronic disorder.

Many factors may trigger an episode of asthma or bronchial constriction including exposure to allergens, noxious fumes, cold air, exercise or respiratory infections such as “colds” or flu. The increase in breathing resistance due to narrowing of the airways may be aggravated by the collection of mucus within the airways.

As far as diving is concerned, there are basically three issues that make scuba diving risky for asthmatics:

- (1) increased breathing resistance with build-up of carbon dioxide,
- (2) increased risk for lung overpressure injuries, and
- (3) effects of the medication on diving.

INCREASED BREATHING RESISTANCE

As soon as the human body is immersed in water, there is an increased resistance to breathing due to the mechanical and anti-gravity effects of being in water. In addition, there may be greater oxygen consumption and carbon dioxide production due to exercise as this requires a greater exchange of air and more breathing effort. There is also the effect of depth on gas density: with greater density of gas comes a further increase in breathing resistance. In an individual with breathing difficulties due to asthma, these additional demands on the body may be sufficient to lead to a critical build-up of carbon dioxide with panic or loss of consciousness.

LUNG OVERPRESSURE INJURIES

Narrowing of the airways and mucus production impairs the ability to exhale easily. As a result, air trapping may occur during ascent, particularly in an emergency ascent due to panic or breathlessness. This predisposes the diver to pulmonary barotrauma leading to pneumothorax, pneumomediastinum and/or cerebral arterial gas embolism.

EFFECTS OF THE MEDICATION ON DIVING

The “reliever” pumps can lead to a tremor and anxiety, which may predispose to loss of dexterity and diving accidents. A further theoretical concern is that some of the medications also lead to dilation of the blood vessels in the lungs, which may cause a loss of effectiveness in filtering out small bubbles commonly formed during decompression. This increases the risk of paradoxical embolism (i.e. gas embolism not caused by pulmonary barotrauma). The risk is obviously difficult to quantify or prove.

DETERMINING FITNESS TO DIVE IN DIVERS WITH ASTHMA

To avoid risks related to impaired breathing and pulmonary overpressure, divers with asthma must have unimpaired lung functions that remain stable during the normal exposures related to diving. Divers who experience persistent or regular asthma attacks in response to exercise, cold or “stress” are discouraged to dive. Diving should obviously be avoided during and up to 48 hours after an asthma attack or any upper respiratory tract infection causing pulmonary symptoms (i.e. coughing or wheezing). Previously the only asthmatics that were considered fit for recreational diving were those whose symptoms were completely controlled on inhaled cortisone. The use of a short-acting bronchodilator, also called “rescue” or “reliever” medication (e.g. Ventolin® or Venteze®) was not considered appropriate as its effects were unpredictable and short-lived. With more modern long acting bronchodilators (e.g. Serevent®) or combination bronchodilator/cortisone combinations (e.g. Seretide®) – also called “controller medication” – some divers are now permitted to dive if their symptoms are controlled completely and their lung function remains stable and unimpaired. However, the asthma should be stable for at least three months after starting the medication. The following would indicate the need for reassessment of medical fitness to dive: (1) any deterioration in pulmonary function, wheezing or regular early morning coughing; (2) any intercurrent asthma attack or need for “rescue” or “reliever” medication in addition to the long acting medication; and (3) any significant chest infection (i.e. symptoms lasting more than a week).

Asthma is known for its tendency to wax and wane. Symptoms appear with a chest cold and remain for several weeks thereafter. Autumn and spring may bring exposure to allergens that provoke attacks. As a result, fitness to dive cannot be assumed and it must be assessed consciously by the diver prior to each dive.

Diving is not recommended unless the diver is completely free of respiratory symptoms before each dive. Indeed, most diving medical experts agree that asthmatics should not dive within 48 hours of using “rescue” or “reliever” medication and experiencing complete relief of symptoms.

If an asthmatic has an attack, spirometry (a common pulmonary function test measuring lung function) should be done to assess the severity and need for treatment. The individual should not dive until the airway function returns to normal. Mild to moderate asthmatics with normal screening spirometry can be considered candidates for diving if their exhaled volume of air in one second (i.e. FEV1) is at least 75% of the full volume of exhaled gas (i.e. FVC). The risk of diving is probably acceptable if the diving candidate, with a history of asthma, shows no deterioration in lung function after strenuous exercise. However, divers must be made aware that they are facing an increased risk of an adverse event related to diving and no diver with asthma should be diving without restrictions. The minimum restrictions needed for diving are: (1) the diver should follow a personal testing protocol and (2) diving should be adapted to account for possible problems. **AD**

ADAPTED DIVING PRACTICES

As depth increases the density and risk, asthmatic divers should refrain from doing deep dives (i.e. no deeper 30 m). Deeper dives typically require decompression stops which a diver with asthma may not be able to complete if problems arise. Diving in areas where medical facilities are not available would also be a risk to consider.

PERSONAL TESTING PROTOCOL:

The first step is to ensure that your asthma is well controlled. This is done in collaboration with your treating physician. The control required for diving means that you should never, or very rarely, wheeze if on “controlling” medication or have to use your “reliever” medication. The severity of attacks is also an important factor and persons who have needed hospitalisation for their asthma within the past five years should not dive. If the asthma is well controlled, the diver should be seen by a doctor specifically trained in diving medicine. The objective is to assess the lung function values and to determine whether enough reserve capacity exists. Many divers may then need to see a specialist pulmonologist for further evaluation.

After being cleared by the diving doctor, the diver should buy himself a peak flow meter (available at large pharmacies). Follow the instructions carefully to ensure that you perform the measurements correctly. The diver needs to perform a number of measurements per day for a period of at least two weeks. These measurements can be used to determine the “normal” peak flow values for the person. The person then performs a peak flow the day before diving and on the day of the dive. If the peak flow has decreased by more than 10% of the normal maximum value, the person should not dive until 48 hours after returning to normal.

Example: The value of the early morning peak flow of the diver was 650 ml. A 10% drop in the value would mean that a value of less than 585 ml (650 ml – 65 ml) on the day of diving indicates that it is probably not safe for that person to dive.

DAN Research Activities

Update

By Dr Frans J Cronjé

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A major step forward in the area of diving-related research is the close relationship that has developed between DAN-SA and DAN Europe and the University of Stellenbosch.

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The primary mission of DAN is to provide emergency medical advice and assistance for underwater diving injuries, to work to prevent injuries and to promote diving safety. The associated mission is to promote and support underwater diving research and education, particularly as it relates to the improvement of diving safety, medical treatment and first aid. Thirdly, DAN strives to provide the most up-to-date and unbiased information on issues of common concern to the diving public, primarily, but not exclusively, for diving safety.

All three of these mission-related areas require dedicated research. They form the blueprint for the activities of DAN in the area of diving-related research.

DAN collects information from around the world and conducts studies in the field and in a laboratory setting to provide scientific data to answer relevant diving safety questions, investigate causes and incidences of injuries and fatalities in diving, and improve the therapy of dive injuries.

DAN RESEARCH PARTNERSHIP WITH UNIVERSITY OF STELLENBOSCH

A major step forward in the area of diving-related research is the close relationship that has developed between DAN-SA and DAN Europe and the University of Stellenbosch. In 2004, both DAN organisations signed an intellectual partnership agreement with the University of Stellenbosch. The partnership has been strengthened further by the appointment of Dr Jack Meintjes of the University of Stellenbosch as DAN-SA Medical Director and Dr Frans Cronjé as Senior Lecturer at the University of Stellenbosch. Professor Barney de Villiers from the University of Stellenbosch is also one of the DAN-SA board members and Sr Surita Fitchat has been appointed as Senior Nurse at the University of Stellenbosch. This relationship with the University of Stellenbosch as knowledge partner enhances the credibility of DAN-SA research and provides practical support in terms of research study design, epidemiology, statistical analyses and ethics committee review.

ONGOING DAN RESEARCH PROJECTS – FIELD TESTING

Project Dive Exploration/Dive Safety Laboratory

PDE/DSL is an observational research study that collects and analyses dive profile data on real dives, and compiles data on behavioural and health aspects associated with recreational diving. To date, more than 150 000 diving profiles have been collected with approximately 50 cases of decompression illness and various other injuries and illnesses – mostly minor in nature, but still significant to the injured diver. DAN analyses the dive profiles as recorded by a depth/time recorder for each dive. The diver's health status is also verified 48 hours after exiting the water. Any diver can participate in this project by donating the data related to their diving activity to DAN. This allows DAN to review diving activities around the globe and, if injuries or accidents do occur, to respond by providing information or undertaking research to improve diving safety in areas that appear to be unduly risky. To participate in this project, visit our website on www.dansa.org



Image by Fiona Ayerst

Oxygen Use Survey Card

DAN Research is studying the effectiveness of the oxygen as first aid for diving emergencies. Unfortunately, unless informed of its use, DAN often doesn't know when oxygen first aid is used in the field. If you haven't received a copy of the Oxygen Use Survey Card, but would like to have a copy on hand to submit to DAN, you may download it (PDF 53 kb) at:

<http://www.diversalertnetwork.org/training/oxygen/O2SurveyCard.pdf>

Injury Database

DAN's Research and Medical departments collect data on dive injuries of recreational divers who were treated in recompression chambers. This data is provided by recompression chambers in the DAN Southern Africa region. DAN-SA then compiles case reports and includes data from these reports in DAN's annual Report on Decompression Illness, Diving Fatalities and Project Dive Exploration.

Fatality Database

DAN collects data on diving fatalities of recreational divers in the United States, Canada and diving destinations frequented by U.S. and Canadian divers. DAN compiles case reports, and includes data from these reports in DAN's annual Report on Decompression Illness, Diving Fatalities and Project Dive Exploration.



Image by Fiona Ayerst

ONGOING FORMAL RESEARCH AND LABORATORY STUDIES

DAN is involved in a number of formal research projects around the globe. Those specific to the DAN Southern Africa region are listed below. To see what is happening in the DAN America and DAN Europe regions, visit: <http://www.diversalertnetwork.org/research/index.asp> (DAN-America) and https://www.daneurope.org/eng/english_.htm (DAN Europe).

The association between deep decompression stops and spinal cord DCS in rats

Decompression sickness (DCS) in divers remains a significant clinical problem in spite of appropriate diving safety measures. The exact mechanism of neurological DCS remains elusive. Recent research with human recreational divers at 82 fsw (25 m) has shown that the introduction of a "deep stop" at half the absolute dive pressure significantly decreases supersaturation of neurological tissues. This study will test the hypothesis that the introduction of a "deep stop" is able to avoid the appearance histologically verifiable of spinal cord DCS in rats. Previous experimental and clinical work permits extrapolation to humans making this a clinically significant study. The objective of this study is to determine whether a deliberate stop during decompression, as opposed to gradual decompression of similar duration, reduces the incidence of a histopathologically verifiable manifestation of spinal cord decompression sickness in rats. If confirmed, this will lead to a fundamental change in our understanding of decompression theory and have potential impact on the safety of five million people participating in compressed gas diving worldwide. Previous work allows for better extrapolation from rodents to humans. The primary investigator is Dr Frans Cronjé of DAN Southern Africa. He is supported by the University of Stellenbosch and several international co-workers including Prof Peter Bennett and Dr Ole Hyldegaard. The study is funded by the University of Stellenbosch with additional research by DAN Europe, DAN Southern Africa and the Undersea and Hyperbaric Medical Association.

BScMedScHons (Underwater Medicine) student research projects

- **Middle Ear Barotrauma Study:** This study looked at the prevalence of middle ear barotrauma in novice (student) divers. The aim was to quantify the disease and to assess whether this has a significant influence on the ability of the student to complete the diving course. The results of this study indicated that although many students suffer mild degrees of middle ear barotrauma, this is in general not to such a degree that the student could not complete the course. The study, however, also indicated that students suffering from barotrauma all had symptoms before, which could have urged the instructor to practice caution and thus prevent injury. The next step is to take this study (that was conducted in the pool

“
To date, more than 150 000 diving profiles have been collected with approximately 50 cases of decompression illness and various other injuries and illnesses – mostly minor in nature, but still significant to the injured diver.

”

sessions of a diving school) to the open water. This will help determine what the incidence of middle ear barotrauma is in these settings.

- **DAN-SA hotline Emergency Calls Analysis:** This is a study that described the demographics of the emergency calls received by the hotline. The origin of the call, as well as which actions were necessary are studied. DAN-SA can use the results of this study to decide on possible interventions to prevent emergencies as well as plan resource allocation based on the emergency needs of our clients. The study indicated that diving at Sodwana is not associated with a high incidence of decompression sickness. This is likely due to the fact that many novice divers are diving in this area and at relative shallow depths. The number of decompression sickness cases is however much higher in the southern parts of Mozambique – probably due to the fact that more experienced divers dive in this setting and the dives are much deeper and longer.
- **Cucumber Diver Dive Profiles:** The cucumber divers of Zanzibar are one of the few diving populations that still dive using empirical diving techniques. Other divers using empirical techniques have been described before, but the Zanzibar population and their diving profiles have never been described. This study aims to describe the dive profiles performed by these divers, as well as symptoms experienced as a result of their diving. The results of this study are not available yet.
- **Evaluation of breathing air quality in South Africa:** This study is planned for 2009. Previous incidents internationally have indicated that divers are sometimes provided with air that is not safe or suitable for breathing. Incidents in South Africa seem to be rare, but no one has performed a specific study to determine the safety of the breathing gas. The study will investigate the practices of compressor operators and test the air that is provided.

It is envisaged that a number of students from each year group would approach DAN-SA for collaboration in research projects. This provides DAN-SA with an opportunity to suggest research in areas of strategic importance.

INTERNATIONAL DAN RESEARCH COLLABORATION

During a strategic IDAN Research Retreat in Brussels from 5-9 April 2007, the leading research teams from DAN-A, DAN-E and DAN-SA had the opportunity to define the common research mission and develop a strategic research action plan. The following are the key points that were discussed:

- policy and principles for collaboration on IDAN research;
- policy and principles for the use of DAN information;
- harmonisation and integration of DAN data collection platforms;
- optimisation of resource pooling and research funding through strategic partnerships and research project allocation.

Specific action items included (a) the merging of PDE/DSL data sets; (b) internationalisation of the Medical Services Call Center (MSCC) – an international, web-based research tool; (c) establishing a biostatistics workgroup; and (d) conducting research on Diving Medical Education and Diving Medical Fitness (safety and risk).

Prof Barney De Villiers served as chair at the meeting with Dr Frans Cronjé acting as facilitator. The University of Stellenbosch was also represented by Dr Jack Meintjes and Chris Müller. The event was most successful and represents major progress in international research collaboration. We look forward to the implementation of these projects over the next two years. **AD**

“
We encourage
our DAN
members
to contact
us about
becoming
involved in
DAN research.
It can be as
simple as
uploading your
dive profiles
and a simple
questionnaire
or as
complicated as
undertaking a
formal research
project.”

DAN research remains the cutting edge of DAN's diving safety initiatives; it provides scientific credibility and focus to our activity and ensures that it remains topical and current. We encourage our DAN members to contact us about becoming involved in DAN research. It can be as simple as uploading your dive profiles and a simple questionnaire or as complicated as undertaking a formal research project. Contact DAN today to find out how you can become involved in making recreational diving even safer.

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Back Jac: Rear inflating jacket with a large volume: 20 kg for size M. Two front fold-away pockets, two rear pockets, adjustable elasticised band. Lock Aid System weight pockets.

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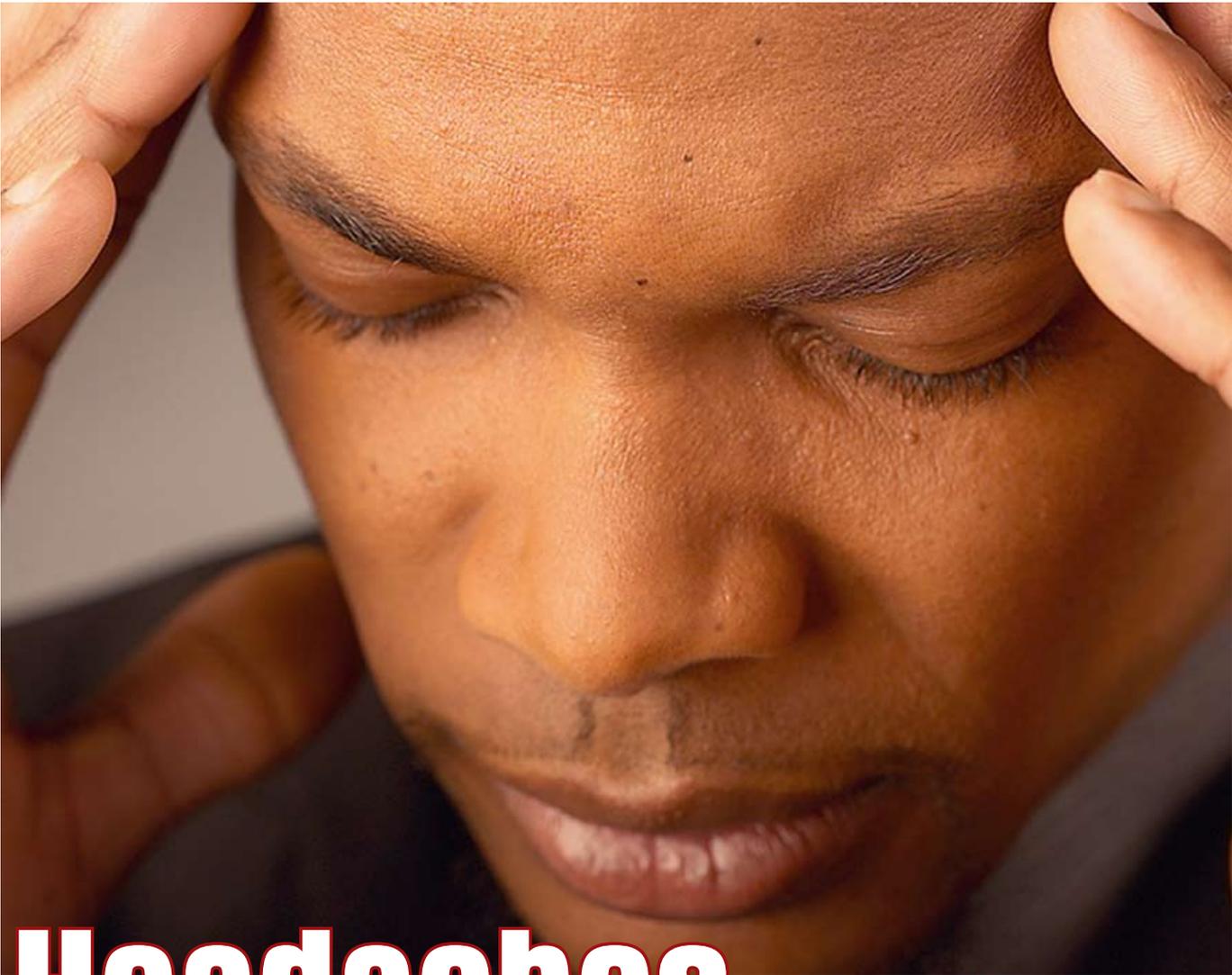
Aero Pro: Large volumes. Size M: 18.50 Kg. Fully adjustable shoulder straps. Fully adjustable shoulder straps.

Aero Queen: same features of the Aero Pro but specific style and anatomy for women. Adjustable elasticised band. Lock Aid System weight pockets.

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AERO LIGHT ↑



Headaches and Diving

By Dr Frans J Cronjé

Headaches are one of the most common complaints in general medical practice. It is not surprising that they are also common in diving. Apart from the discomfort related to them, there is a concern that they may be the result of a more deep-seated or ominous problem.

The management of diving-related headaches is done on three levels:

- (1) Understanding what causes them – with the objective of prevention;
- (2) Knowing when a headache is serious – with the purpose seeking professional medical assessment; and
- (3) Knowing how minor diving-related headaches can be prevented or treated.

Surprisingly, the centre of our consciousness and all sensory input – the brain – is itself not particularly pain sensitive. There are only a limited number of areas within the brain, skull and scalp that transmit pain impulses. This is helpful when trying to understand and unravel the causes of a headache.

Pain around the head is particularly associated with four zones:

Zone 1: The blood vessels of the meninges or membranes surrounding the brain

These blood vessels transmit pain impulses when they become dilated or irritated. The pain is usually throbbing in nature and may be associated with vomiting. If the meninges are also irritated, neck stiffness may be present.

Zone 2: The scalp from the nape of the neck to the top of the head

This area, supplied by the uppermost nerves from the spinal cord, may be irritated as a result of persistent muscle contraction of the neck and associated scalp muscles. Irritation of this area usually results in a deep, band-like and constricting pain, with a possibility of scalp tenderness.

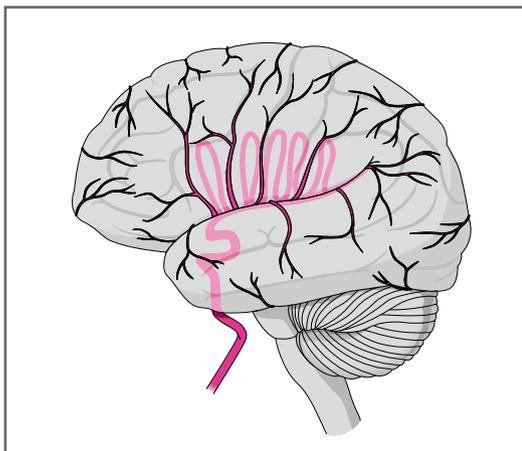
Zone 3: The scalp and facial structures of the face, forehead and teeth

This area is supplied by the trigeminal nerve (5th cranial nerve), which is particularly sensitive to pain. Pain usually has a stinging, burning or sharp, stabbing quality – like toothache. This area also contains the jaw muscles and jaw hinge joint – called the tempero-mandibular (TMJ) joint.

Zone 4: The sinus and middle ear cavities

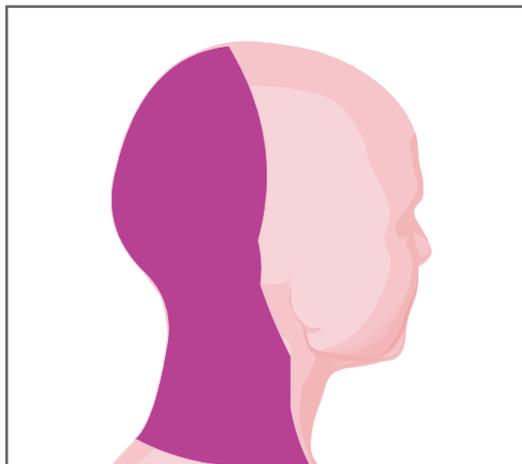
These structures are sensitive to pressure and inflammation. Pain is usually experienced as a painful fullness or burning which is referred to the skin closest to the affected cavity. The pain is often exacerbated by lowering the head.

The purpose of this section is not to explore everyday headaches (although they follow the same principles previously outlined); our purpose is to list those specifically associated with diving. If you suffer from regular or severe headaches, we recommend you have these assessed by a healthcare professional.



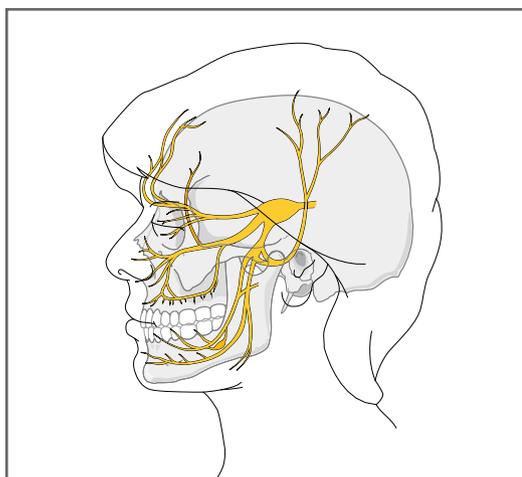
ZONE 1

The blood vessels of the meninges or membranes surrounding the brain.



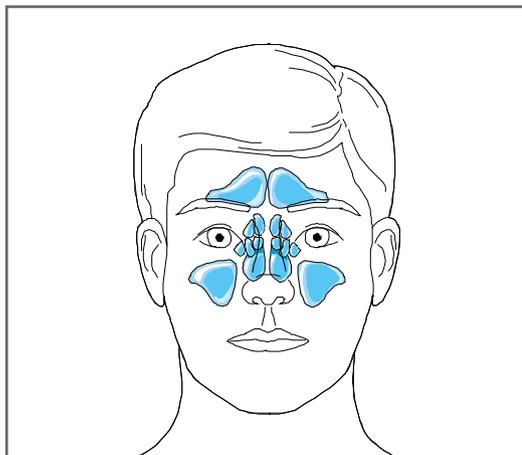
ZONE 2

The scalp from the nape of the neck to the top of the head.



ZONE 3

The scalp and facial structures of the face, forehead and teeth.



ZONE 4:

The sinus and middle ear cavities.

THE MOST COMMON CAUSES OF DIVING-RELATED HEADACHES

(Listed according to the zones in which they are experienced):

ZONE 1

- Cold water
- Caffeine, alcohol, and other drugs
- Gas toxicity (especially high CO₂)
- DCI (mostly in combination with other problems – weakness or numbness)

ZONE 2

- Hyperextension of the neck
- Anxiety/Tension

ZONE 3

- Tooth, sinus or ear barotrauma (acute)
- TMJ pain (acute)

ZONE 4

- Sinus and ear infections
- Mask tension
- TMJ pain (chronic)

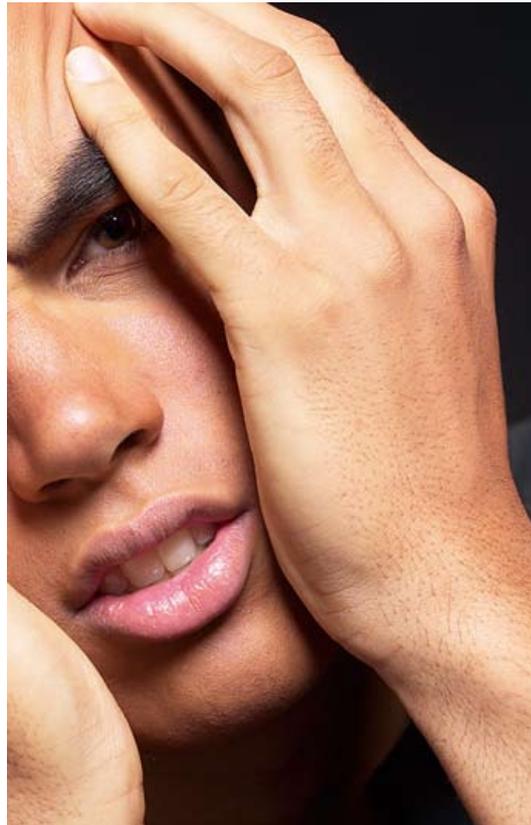
“
Suppressing headaches with analgesics provides subjective relief, but these drugs may interfere with alertness or exacerbate nitrogen narcosis and are not recommended with diving.
 ”

Headaches that are mild and have a gradual onset over the course of a day are rarely serious. Most of us suffer from these from time to time. However, the following features would suggest the possibility of an underlying problem and should receive prompt medical attention:

- Sudden, severe onset: “the worst headache I’ve ever had” or “thunderclap headache”.
- Any headache associated with altered consciousness or sleepiness.
- Any headache associated with nausea and/or vomiting (unless previously appropriately investigated and clearly attributed to a migraine).
- Any headache associated with neck stiffness, fever, visual or other neurological disturbances.
- Any headache following an event or incident while diving, e.g. rapid ascent, omitted decompression stop, etc.
- Morning headaches – unless clearly related to alcohol toxicity.

REMEDIES FOR MINOR DIVING-RELATED HEADACHES

Suppressing headaches with analgesics provides subjective relief, but these drugs may interfere with alertness or exacerbate nitrogen narcosis and are not recommended with diving. Most diving physicians would not be particularly concerned with divers taking acetaminophen (or paracetamol) or low-dose ibuprofen, but narcotic or sedating drugs should definitely be avoided.



Better than any treatment though, is prevention, and there are several quick-fix solutions that may be useful in preventing diving-related headaches (and are good diving practice anyway). They include:

- Loosening the mask strap to avoid pressure on the nose, forehead or cheekbones. If necessary, change to a more comfortable mask. Exhalation through the mask should be easy, and exerting gentle pressure on the mask should not result in pain or discomfort.
- Relaxing the neck during dives. Even though it may spoil your trim momentarily, rotating the body rather than the head to look at objects underwater may avoid the strain and the discomfort of hyperextending the neck. Also ensure that the pillar valve is set low enough in the BC that it does not force hyperextension of the neck to avoid banging the head on it.
- Relaxing during dives.
- Taking slow deep breaths. This is relaxing and a more efficient way of removing carbon dioxide. Don't suppress the need to breathe by breathing less. To reduce your air consumption, relax and reduce the amount of carbon dioxide that is produced.
- Staying in shape. Exercise reduces the incidence of headaches.
- Avoiding caffeine and tobacco with diving.
- Always following safe diving practices. Spend three to five minutes at a safety stop at three to five metres below the surface. It is relaxing (weather and conditions permitting) and allows time to reduce the carbon dioxide build up from finning to the surface.
- Wearing adequate thermal protection, especially a hoody.
- Going for regular dive medical examinations: biennial below 40, and annually thereafter.

Headaches can spoil a diving trip or vacation and detract from the wonderful underwater experience of our unique sport. Many headaches are simple to cure once the cause has been determined. The above-mentioned suggestions should allow most divers to steer away from headaches, but remember that unless a headache is easily explained, it is always better to go for a check-up. If they are recurrent, seek medical advice. **AD**

Diabetes and Diving

By Dr Frans J Cronjé



Historically, the diving medicine community has maintained a very conservative position on diabetes, primarily due to concerns about glucose-related loss of consciousness and disease-related impairment of fitness and exercise capacity.

Until recently, the nearly universal approach to diabetes has been to ban all persons with insulin-requiring forms of diabetes mellitus (IRDM) from diving. In addition, all types of diabetes in which there is some loss of physical fitness or evidence of damage to body organs were considered contra-indications to diving.

These conservative views have been challenged in recent years. Recognising that a substantial number of divers are diving successfully with diabetes, either openly or surreptitiously, many have felt that the time has come to acknowledge this fact and re-examine the position concerning diabetes and diving.

The data available at this time supports the position that at least some individuals with diabetes might reasonably be allowed to dive. Two key factors must be understood:

- (1) At the recent DAN workshop, only recreational diving was considered. 18 Issues concerning professional diving require future, separate deliberations; and
- (2) Any general recommendations must be seen as guidelines that should be individualised and tailored to the specific needs and the condition of the individual in question.

It is also realised that other appropriate and justifiable procedures may exist and that interest groups must have the flexibility to use the guidelines that best serve the needs of the divers in question.

The recommendations of the DAN/UHMS workshop are summarised alongside. **AD**

ASSESSMENT OF DIVING MEDICAL FITNESS

Guidelines for Recreational Diving with Diabetes Summary form

Selection and Surveillance

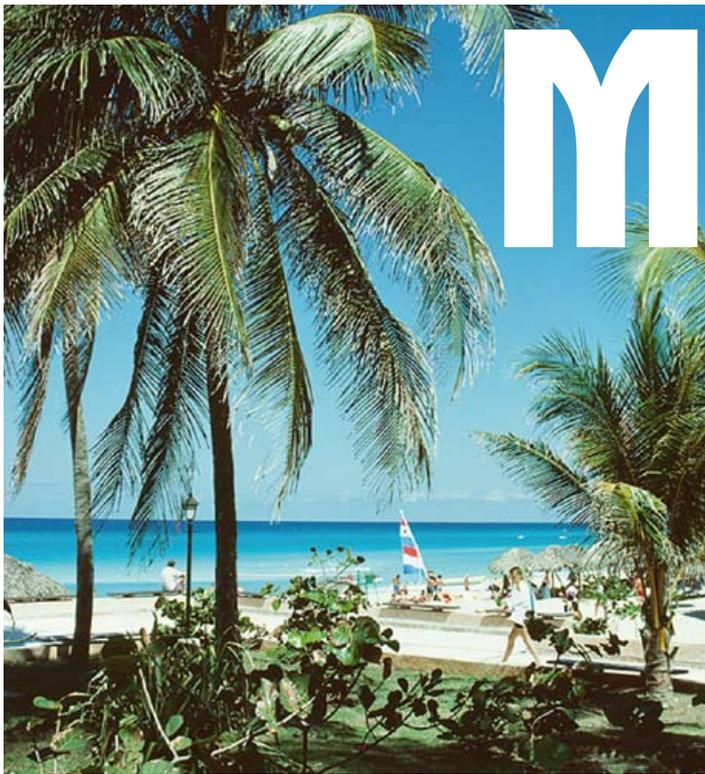
- Age \geq 18 years (\geq 16 years if in special training programme)
- Delay diving after start/change in medication
 - Three months with oral hypoglycaemic agents (OHA)
 - One year after initiation of insulin therapy
- No episodes of hypoglycaemia or hyperglycaemia requiring intervention from a third party for at least one year
- No history of hypoglycaemia unawareness
- HbA1c \leq no more than one month prior to initial assessment and at each annual review
 - Values $>$ 9% indicate the need for further evaluation and possible modification of therapy
- No significant secondary complications from diabetes
- Physician/diabetologist should carry out annual review and determine if diver has good understanding of disease and effect of exercise
 - In consultation with an expert in diving medicine, as required
- Evaluation for silent ischemia for candidates $>$ 40 years of age
 - After initial evaluation, periodic surveillance for silent ischemia can be made in accordance with accepted local/national guidelines for the evaluation of diabetes
- Candidate document intent to follow protocol for divers with diabetes and to cease diving and seek medical review for any adverse events during diving possibly related to diabetes

Scope of Diving

- Diving should be planned to avoid:
 - depths $>$ 100 fsw (30 msw)
 - durations $>$ 60 min
 - compulsory decompression stops
 - overhead environments (e.g. cave, wreck penetration)
 - situations that may exacerbate hypoglycaemia (e.g. prolonged cold and arduous dives)
- Dive buddy/leader should be informed of diver's condition and steps to follow in case of problem
- Dive buddy should not have diabetes

Glucose Management on the Day of Diving

- General self-assessment of fitness to dive
- Blood glucose (BG) \geq 150mg.dL -1 (8.3 mmol.L-1), stable or rising, before entering the water
 - Complete a minimum of three pre-dive BG tests to evaluate trends (60 minutes, 30 minutes, and immediately prior to diving)
- Delay dive if BG
 - $<$ 150 mg.dL-1 (8.3 mmol.L-1)
 - $>$ 300 mg.dL-1 (16.7 mmol.L-1)
- Rescue medications
 - Carry readily accessible oral glucose during all dives
 - Have parenteral glucagons available at the surface
- If hypoglycaemia is noticed underwater, the diver should surface (with buddy), establish positive buoyancy, ingest glucose and leave the water
- Check blood sugar frequently for 12 to 15 hours after diving
- Ensure adequate hydration on days of diving
- Log all dives (include BG test results and all information pertinent to diabetes management)



Malaria

Prevention and Prophylaxis

By Dr Frans J Cronjé,
MBChB(Pret), MSc

Dr Albie De Frey,
MBChB(Pret),
FFTM (ACTM),
FFTM (RCPSG)

Dr Hermie C Britz,
MBChB(Pret),
BSc(Hons)
Aerosp Med

Malaria is a perennial concern to travellers in Africa. Of all the questions DAN receives, malarial prophylaxis is one of the most common. Safety of medication while diving and drug resistance considerations are the most pressing issues. As divers venture deeper into the African tropics, the risks of contracting malaria increase proportionally. Lack of medical facilities, transportation and communication add additional complexity to managing this medical emergency. Understanding malaria prophylaxis and general preventative measures is therefore of the utmost importance. The following section covers the most important considerations in selecting and using malaria prophylactic measures and medications. The medical treatment of malaria, which is complex and requires close medical supervision, falls outside the scope of this article. If you think that you may have malaria or are concerned about unexplained symptoms after visiting a malaria area, contact DAN immediately.

The three most important guidelines regarding malaria prevention and survival are:

- Do not get bitten
- Seek immediate medical attention if you suspect malaria
- Take “the pill” (Anti-malaria tablets/prophylaxis)

(1) DO NOT GET BITTEN

- Stay indoors from dusk to dawn.
- If you have to be outside between dusk and dawn, cover up with long sleeves, trousers, socks and shoes (90% of mosquito bites occur below the knee).
- Apply DEET containing insect repellent to all exposed areas of skin; repeat four-hourly.
- Sleep in mosquito-proof accommodation:
 - Air-conditioned and/or proper mosquito gauze
 - Buildings/tents regularly treated with pyrethrum-based insect repellent/insecticide
 - Burn mosquito coils/mats
 - Sleep under an insecticide impregnated (Permacote®/Peripel®) mosquito net (very effective)

(2) SEEK IMMEDIATE MEDICAL ATTENTION IF YOU SUSPECT MALARIA

- Any flu-like illness starting seven days or more after entering a malaria endemic area is malaria until proven otherwise.
- The diagnosis is made on a blood smear or a rapid malaria antigen finger prick test.
- One negative smear/rapid test does NOT exclude the diagnosis. Repeat the smear/rapid test until the diagnosis is made; another illness is conclusively diagnosed or spontaneous recovery occurs, e.g. from ordinary influenza.

(3) TAKE "THE PILL"

There are several dangerous myths regarding malaria prophylaxis.

- Prophylaxis does not make the diagnosis more difficult
- It does protect against the development of cerebral malaria
- Prophylaxis is not 100% effective - hence the importance of avoiding bites
- Not all anti-malaria medication is safe with diving
- Malaria is often fatal - making prophylaxis justified

Anti-malaria drugs, like all drugs, have potential side effects. The majority of side effects decrease with time. Serious side effects are rare and can be avoided by careful selection of a tablet or combination of tablets to suit your requirements (country, region and season).

The following drugs are available for the prevention of malaria:

(1) Doxycycline (Vibramycin® or Cyclidox® or Doryx®, etc.):

- Used extensively in the prevention of chloroquine resistant malaria. About 99% effective. Not officially recommended for use in excess of eight weeks for malaria prevention, but it has been used for as long as three years with no reported adverse effects. Offers simultaneous protection against tick-bite fever.
- Dosage: 100 mg daily after a meal starting one - two days before exposure until four weeks after exposure. Doxycycline should be taken with plenty of non-alcoholic liquid.
- Contra-indications: Pregnancy, breastfeeding, children < eight years.
- Side effects: Nausea, vomiting, diarrhoea, allergy, photosensitisation. May cause vaginal thrush and may reduce the efficacy of oral contraceptives.
- Use in pregnancy: Unsafe (as is scuba diving).

Doxycycline is DAN-SA's agent of choice for divers diving in sub-Saharan Africa as well as other areas with chloroquine resistance/"resistant malaria".

(2) Chloroquine (Nivaquine® or Daramal® or Plasmaquine®):

- Contains only chloroquine. Must be taken in combination with Proguanil (Paludrine®).
- Dosage: Two tablets weekly starting one week before exposure until four weeks after leaving the malaria endemic area.
- Contra-indications: Known allergy, epilepsy.
- Side effects: Headache, nausea and vomiting, diarrhoea, rashes. May cause photosensitivity (sunburn; prevention - apply sun block).
- Use in pregnancy: Safe. (Note: scuba diving is not considered safe during pregnancy.)

(3) Proguanil (Paludrine®):

- Must be taken in combination with Chloroquine (Nivaquine® or Daramal® or Plasmaquine®).
- Dosage: Two tablets every day starting one week prior to exposure until four weeks after.
- Contra-indications: Known allergy to Proguanil. Interactions with Warfarin (An anti-coagulant/blood thinning agent that is incompatible with diving).
- Side effects: Heartburn (Tip: take after a meal, with a glass of water and do not lie down shortly after taking Proguanil); mouth ulcers (Tip: take folic acid tablets, 5 mg per day, if this occurs); loose stools (self limiting - no treatment required).
- Use in pregnancy: Safe, but must be taken with a folic acid supplement: 5 mg per day. (Note: scuba diving is not considered safe during pregnancy.)

The combination of Chloroquine and Proguanil is about 65% effective for resistant falciparum malaria. Although not a first choice, its relative safety and limited side effects may justify its use in certain individuals.

(4) Atovaquone/Proguanil (Malarone®; Malanil®):

- Registered in South Africa as a causal prophylaxis in February 2004. Safety in diving has not been confirmed, but many divers have used it with no adverse effects. Use with caution. Additional sensitivity to motion sickness has been reported anecdotally. Preliminary data suggests it is safe for pilots.
- Effective against malaria isolates that are resistant to other drugs.
- Controlled studies have shown a 98% overall efficacy of Atovaquone/Proguanil in the prevention of P. falciparum malaria.
- Dosage: One tablet daily for adults, starting 24 - 48 hours prior to arrival in endemic area, during exposure in endemic area and for seven days after leaving the endemic area. Dose should be taken at the same time each day with food or a milky drink.
- Contra-indications: Known allergy to Proguanil or Atovaquone or renal impairment (i.e. significant renal disease is likely to be incompatible with diving). Safety in children < 11 kg has not been established.
- Side effects: Heartburn (Tip: take after a meal with a glass of water and do not lie down shortly after taking Atovaquone/Proguanil); mouth ulcers. To date, Atovaquone has been well tolerated with the most common adverse reaction being headaches.
- Use in pregnancy: Safety in pregnancy and lactating women has not been established. (Note: scuba diving is not considered safe during pregnancy.)

“
Doxycycline is DAN-SA's agent of choice for divers diving in sub-Saharan Africa as well as other areas with chloroquine resistance/ "resistant malaria".
 ”

SUMMARY

- (1) Prophylaxis significantly reduces the incidence of malaria and slows the onset of serious symptoms of malaria.
- (2) All anti-malaria drugs, excluding Mefloquine, are considered compatible with diving.
- (3) Like with all other medication, anti-malaria drugs should be tried and tested on land well in advance.
- (4) If unpleasant side effects occur, please consult your doctor or DAN.
- (5) Whether or not you take prophylaxis, be vigilant about potential malarial symptoms. Malaria can present itself in many ways varying from fever and diarrhoea to flu-like symptoms. Always inform your doctor that you have been in a malaria area. Symptoms can start within 7-14 days from first exposure until 30 days (and rarely even months) after leaving a malaria area.
- (6) No single medication is 100% effective and barrier mechanisms/ personal protection against bites (e.g. mosquito repellents, nets, protective clothing, not going outdoors from dusk to dawn) must be applied.
- (7) Any strange symptom occurring during or within six weeks of leaving a malaria area should be regarded with suspicion and requires medical attention.

The above-mentioned recommendations were compiled from material supplied by the National Department of Health and Worldwide Travel Medical Consultants.

(5) Mefloquine (Lariam® or Mefliam®):

- About 90% effective against chloroquine resistant malaria. Convenient dosing schedule.
- Dosage: One tablet per week.
- Side effects: May cause drowsiness, vertigo, joint aches and interfere with fine motor coordination (making it difficult to exclude DCI in some cases).
- Use in pregnancy: Probably safe in early pregnancy and may be used with confidence after the first trimester of pregnancy. May be used in breast feeding and babies weighing more than 5 kg.

Mefloquine is considered unsafe for divers and pilots. It is contra-indicated in epilepsy but is a good first choice for other travellers.

(6) Pyrimethamine/Dapsone (Maloprim® or Deltaprim®/Malazone®):

- No longer regarded as effective.

(7) Sulfadoxine and Pyrimethamine.

- (Fansidar®):
- No longer used as prophylactic

(8) Quinine (Lennon-Quinine Sulphate®):

- Not used for prophylaxis but is the backbone in the treatment of moderate and severe malaria.
- Serious side effects are not uncommon during treatment.

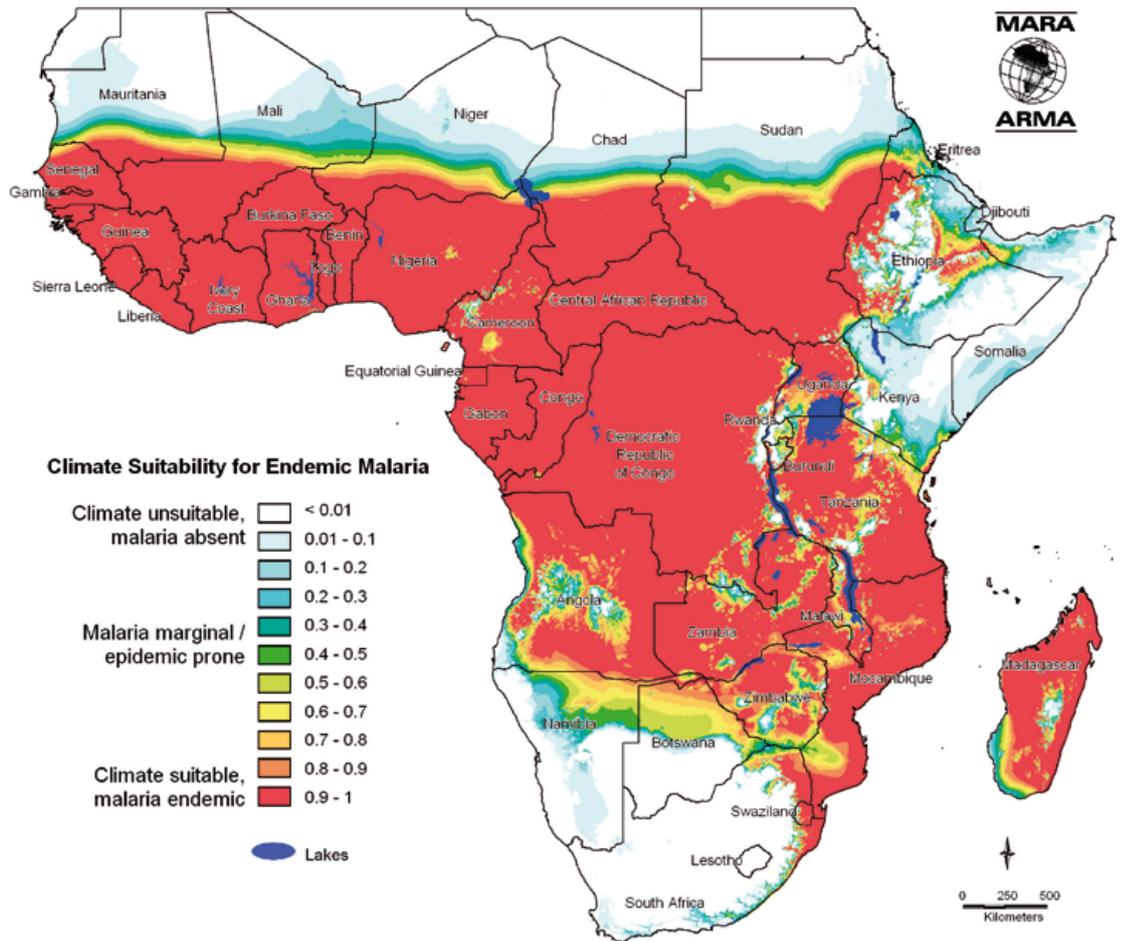
(9) Artemether (Cotexin®):

- The "Chinese drug". Available in some areas of Africa. Not for prophylaxis. Used in combination with other drugs in the treatment of mild to moderate malaria.

(10) Halofantrine (Halfan®):

- Not used for prophylaxis and best avoided for treatment. **A_D**

DISTRIBUTION OF ENDEMIC MALARIA



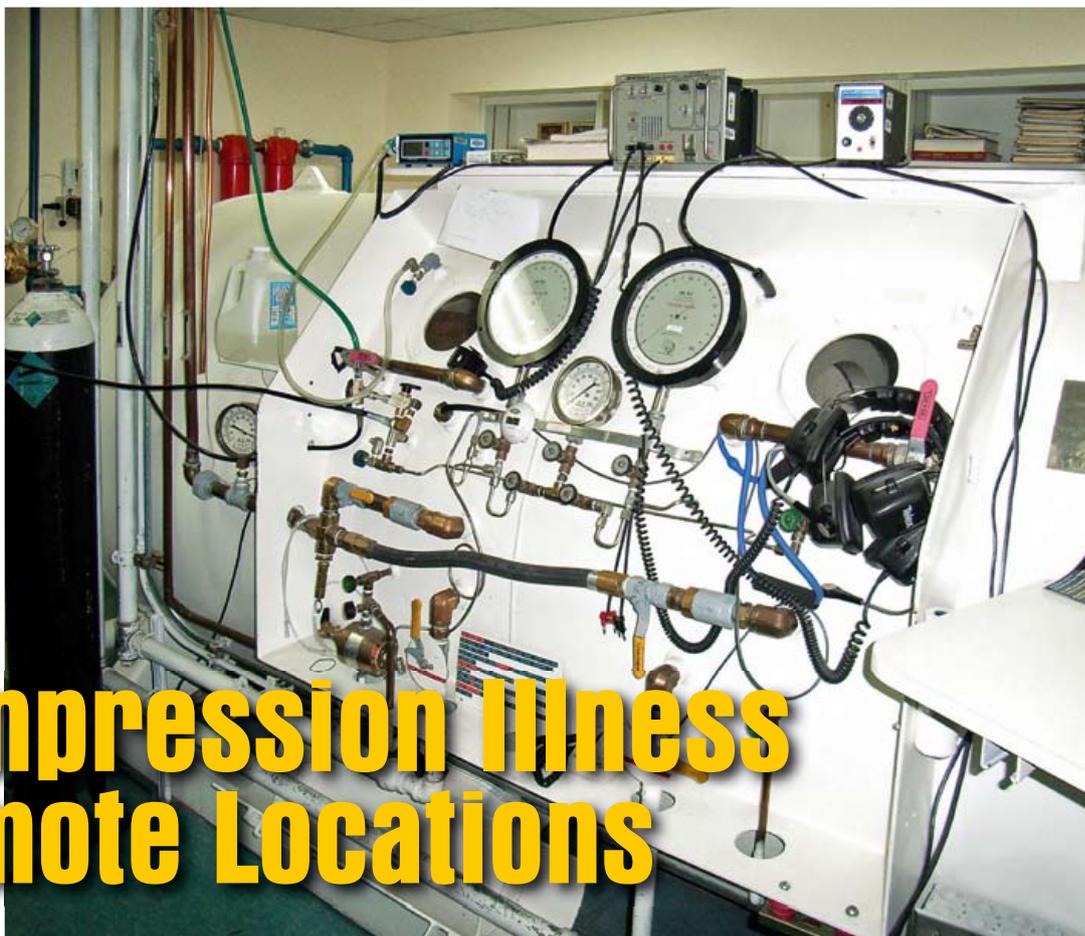
This map is a product of the MARA/ARMA collaboration (<http://www.mara.org.za>). July 2002, Medical Research Council, PO Box 70380, Overport, 4067, Durban, South Africa
 CORE FUNDERS of MARA/ARMA: International Development Research Centre, Canada (IDRC); The Wellcome Trust UK; South African Medical Research Council (MRC); Swiss Tropical Institute, Multilateral Initiative on Malaria (MIM) / Special Programme for Research & Training in Tropical Diseases (TDR), Roll Back Malaria (RBM), Malaria distribution model: Craig, M.H. et al. 1999. Parasitology Today 15: 105-111.
 Topographical data: African Data Sampler, WRI, http://www.igc.org/wri/sdis/maps/ads/ads_idx.htm.

RECOMMENDED MALARIA DRUG PROPHYLAXIS IN DAN SOUTHERN AFRICA REGION (AFRICAN AND INDIAN OCEAN ISLANDS)

AREA	MALARIA	RECOMMENDED DRUGS
Kruger Park Mpumalanga Northern Province KwaZulu-Natal (Excluding Ingwavuma and Ubombo)	Low: June to August/low rainfall. High: Hot wet seasons November to May.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Ingwavuma and Ubombo	Throughout the year.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Swaziland	Throughout the year in lowveld areas.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Zimbabwe	Mainly November to June in areas below 1 200 m and throughout the year in the Zambezi valley.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Angola, Comoros, Kenya, Madagascar Malawi, Mozambique, Zaire	Throughout the year.	# High risk persons: Mefloquine Doxycycline Malanil® Chloroquine and Proguanil *Low risk persons: Nothing
Botswana	Mainly November to June in the northern parts of the country (e.g. Okavango).	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Namibia	Mainly November to June in northern rural areas (e.g. Ovambo, Kavango and Etosha).	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Zambia	Mainly November to June in areas below 1 200 m and throughout the year in the Zambezi valley.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Seychelles	No malaria.	N/A
Mauritius	Only benign forms of malaria in the north.	# High risk persons: Chloroquine in northern areas *Low risk persons: Nothing
Tanzania	Mainly November to June in areas below 1 200 m and throughout the year in the valleys	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing
Zanzibar	Mainly November to June. Mostly benign forms of malaria on the island, but travel through Tanzania may necessitate prophylaxis.	# High risk persons: Mefloquine Doxycycline Malanil® *Low risk persons: Nothing

* In situations where the risk of contracting malaria is low, (e.g. in cities, air-conditioned hotels or when rainfall has been low, etc.) the traveller may be advised to take no drug prophylaxis but standby treatment must be carried unless medical care is readily available. PERSONAL PROTECTION AGAINST BITES MUST BE ADHERED TO AT ALL TIMES.

High risk people include babies and children under five years, pregnant women, elderly people (> 65 years), people with suppressed immunity (e.g. diabetics, etc.).



Decompression Illness in Remote Locations

**Interpretive
Comments on
the Proceedings
of the UHMS
Workshop
24-25 May 2004,
Sydney,
Australia**

By Dr Frans J Cronjé

Decompression illness (DCI) is a dreaded complication of compressed gas diving. For recreational divers it is even worse because diving is often undertaken in areas away from modern health care and diving medical assistance. This means that, not only is a diving vacation ruined, but also that there are legitimate concerns about being able to receive appropriate medical care and eventually getting home again in one piece.

In 2004, the Undersea and Hyperbaric Medical Association hosted a workshop in Sydney Australia, to address the realities of this situation and to determine when delays to recompression would not be significantly deleterious. This by no means suggests that recompression is, or should be considered, optional in these cases. Rather the intent of the workshop was to determine those specific situations where the consequences of not recompressing an individual promptly would not be unduly harmful or irreversible.

The sections in italics are direct transcripts from the UHMS proceedings. The remainder is offered as an interpretive commentary by the author who was an invited discussant at the workshop. The comments do not necessarily reflect the views of the UHMS or the other participants of the workshop. The intent is to render the information so that divers are able to benefit from

the findings while avoiding misinformation and misunderstandings as far as possible.

Firstly, only mild forms of decompression illness are to be considered; serious forms need urgent treatment and dedicated aeromedical evacuation may even be required to reduce or avoid long-term complications. Therefore, to avoid any ambiguity on what constitutes mild DCI and "mild" symptoms and signs, they are defined as, and limited to, the following presentations only:

- *limb pain*
- *constitutional symptoms* (i.e. headache, loss of appetite, malaise, unusual fatigue, etc.)
- *some cutaneous* [skin] sensory changes
- *rash*

where these **manifestations are static or remitting** (i.e. not getting worse or becoming less pronounced) and **objective neurological dysfunction has been excluded by medical examination** (i.e. they are not related to impairment of the nervous system as determined by appropriate medical examination) [see Footnote 1].

Secondly, the workshop accepted that *untreated mild symptoms and signs due to DCI are unlikely to progress after 24 hours from the end of diving* [see Footnote 2]. This means that if someone has had mild symptoms for 24 hours after the last dive, they are unlikely

to get any worse or become more serious in nature.

Thirdly, *Level B epidemiological evidence* (i.e. evidence that is supported by some uncontrolled studies) **indicates that a delay prior to recompression for a patient with mild DCI is unlikely to be associated with any worsening of long-term outcome** [see Footnote 3]. This means that even though the delay may be significant, the outcome is likely to be as good as would have been expected if recompression were readily available.

Fourthly, the workshop acknowledged that some patients with mild symptoms and signs after diving **can be treated adequately without recompression**. For those with DCI recovery **may be slower** in the absence of recompression [see Footnote 4]. Again, this does not suggest that recompression is optional. It only means, in practice, that conservative management with oxygen, fluids and possibly medication may achieve complete relief before the individual is able to reach a recompression facility, although the resolution may be slower than would have been the case had they been recompressed.

Finally, the workshop acknowledged that some divers with “mild symptoms or signs” after diving **may be evacuated by a commercial airliner to obtain treatment after a surface interval of at least 24 hours**, and this is unlikely to be associated with worsening of

outcome [see Footnote 5]. This means that, with proper prior medical assessment and guidance, some divers may be able to return home on a regular commercial flight after their mild symptoms have remained unchanged for at least 24 hours without any deterioration during flight or adverse effect on the ultimate outcome of treatment. This is not a decision divers should make on their own, however. Medical assessment is, and remains, a prerequisite for determining the nature and severity of any signs and symptoms related to diving and for determining whether or not it would be appropriate to fly. When in doubt, call DAN.

The proceedings of this workshop were an important landmark. Its most important findings were that (1) recompression for all forms of DCI was not equally urgent, and (2) that inevitable delays to receiving recompression, due to injured divers being in remote locations, were not necessarily harmful in the case of mild signs and symptoms. As further experience is gained, further refinements may be made to the consensus statements of the workshop.

As DAN members and as responsible divers, it remains imperative to always follow safe and sensible diving practices, to be medically fit to dive, to be prepared for diving emergencies – both in planning and in assuring the availability of appropriate equipment and to offer immediate emergency oxygen first aid for any signs or symptoms that are possibly related to DCI. **AD**

“
The proceedings of this workshop were an important landmark. Its most important findings were that recompression for all forms of DCI was not equally urgent, and that inevitable delays to receiving recompression, due to injured divers being in remote locations, were not necessarily harmful in the case of mild signs and symptoms.”

Footnote 1:

1. The workshop agrees the severity of pain has little prognostic (i.e. predictive value as far as ultimate outcome is concerned) significance, but acknowledges the severity of pain may influence management decisions independent of the classification of pain as a “mild” symptom (i.e. severe pain may prompt more aggressive management than medically necessary due to the discomfort itself rather than the danger to health).
2. Classical girdle pain syndromes are suggestive of spinal involvement and do not fall under the classification of limb pain.
3. The intent of “some cutaneous sensory changes” is to embrace objective cutaneous sensory phenomena such as paraesthesiae (i.e. pins and needles sensation) that are present in patchy or non-dermatomal distributions (i.e. not likely to be related to a large nerve or spinal cord injury) suggestive of non-spinal, non-specific, and benign processes. Subjective sensory changes in clear dermatomal distributions or in certain characteristic patterns such as in both feet, may predict evolution of spinal symptoms and should not be considered “mild”.
4. The proclamation of “mild” cannot be made where symptoms are progressive. If the presentation initially qualifies as “mild” and then begins to progress, it is no longer classified as “mild” (also see Footnote 5).
5. The possibility of delayed progression is recognised, such that the “mild” designation must be repeatedly reviewed over at least the first 24 hours following diving or the most recent decompression, the latter applying if there has been an ascent to altitude. Management plans should include provisions for such progression.

Footnote 2:

1. Mild symptoms and signs are strictly limited to those defined in statement 1 and its footnotes.
2. The statement does not hold where there is a further decompression, such as for the diving or ascent to altitude, in the presence of mild symptoms.

Footnote 3:

1. Levels of evidence in American family physician [Internet]. [Leawood(KS)]: American academy of family physicians;c 2004 [cited 2004 Dec 6]. www.aafp.org/x17444.xml.
2. “Mild DCI” is limited to those presentations exhibiting only “mild symptoms and signs” strictly as defined in statement 1 and its footnotes.

Footnote 4:

1. The non-specific reference to “mild symptoms and signs after diving” is intentional. It reflects the fact that the manifestations may or may not be the consequence of DCI. The statement suggests that even if they are the result of DCI, full recovery is anticipated irrespective of the use of recompression, although resolution may take longer. Importantly, “mild symptoms and signs” are strictly limited to those defined in statement 1 and footnotes. Where symptoms and signs fall outside the spectrum of manifestations herein defined as “mild”, standard management and therapy is indicated.

Footnote 5:

1. “Mild symptoms and signs” are strictly as defined in statement 1 and footnotes.
2. It should be noted that the most favourable experience with commercial airline evacuations comes from short haul flights of between one and two hours duration. There is much less experience with longer flights.
3. It was agreed that provision of oxygen in as high and inspired fraction as possible is optimal practice for such evacuations. In addition, the risk of such evacuation will be reduced by preflight oxygen breathing.
4. It was emphasised that contact must be established with receiving unit at the commercial flight destination before the evacuation is initiated.

Fit^{ness} to Dive

Are you Fit?



Image by Martin Prest

By Dr Frans J Cronjé

Recreational diving is a very popular sport. More than six million people participate world-wide. It is open largely to all who apply for training. Whereas 30 years ago, fitness standards were stringent and all but the most “perfect human specimens” were admitted, the reverse is true today in that all but the most frail individuals apply! This therefore raises the question – when is a person fit to dive?

Being a voluntary and recreational activity, it may surprise you to know that medical fitness verification is not mandatory to participate in recreational diving. However, it is required by those who train individuals to dive. Although reduction in liability is the primary reason for this, dive schools are the only ones actively determining diving fitness. A diver’s entry level course may also be the first and only fitness assessment hurdle they ever need to cross. After that, it is up to the individual, or their dive buddies, to determine whether or not an individual is fit to dive.

While diver training agencies may have different philosophies on diver education, the universal trend on diving fitness assessments is to only send a diver for a formal diving medical assessment if they indicate a medical problem on the diving medical questionnaire they receive as part of their dive training. If they choose not to disclose a problem, and the condition is invisible otherwise, no one is likely to enforce the need for a fitness assessment on them. So, for the most part, it is entirely up to the diver to determine the risk of diving with a given medical condition. Unfortunately, the diver is not in the best position to assess the risk; they typically do not have the necessary background or objectivity to do so. The training agencies, on the other hand, do not wish to overemphasise the potential hazards of the sport and rarely belabour the implications of dishonesty on diving safety. For dive leaders and instructors who earn a living from diving, the situation is only slightly different. These divers have a professional responsibility towards their students or diving clients and, technically speaking, they are occupational divers and should be subject to occupational health and safety legislation. In practice, however, very few countries impose these standards on recreational diving instructors so that, again, it is left up to the diver or their employer to deal with issues of diving fitness. Once they are qualified as instructors, the requirement for diving fitness is no longer imposed.

Having said all this, it is not the objective of this article to convince all divers to undergo a formal diving medical assessment, although this is good advice. Rather, it is intended to offer divers and dive leaders some essential perspective on diving fitness: to allow them to make better safety decisions about themselves and to explain the issues to those presenting potential problems. It will also assist in explaining the rationale and need for formal diving medical fitness assessments when these are indicated.

ARE YOU FIT TO DIVE?

With few exceptions, divers are no longer medically disqualified from diving on the basis of medical diagnosis alone. Previously diabetes, asthma and epilepsy were grounds for immediate disqualification. Today diving fitness assessment takes the form of a more methodical risk assessment: the implications of diseases or their treatment are measured up against the inherent risks of diving and the decision is made whether the combined risk is acceptable or not. Although still somewhat subjective, it is a much more reasonable and justified approach. Divers are also more likely to comply with the findings rather than simply doctor-shopping until they have been released

to go diving. Diving injury and fatality statistics have usually favoured greater leniency by showing that former concerns were greatly overestimated. Nevertheless, certain disorders, like uncontrolled epilepsy, remain absolute contra-indications to diving. This is not due to the diagnostic label, however, it is due to the inability to exclude the very real possibility that such individuals will drown while diving due to loss of consciousness. For most other medical conditions, the risks are individualised.

BASIC FITNESS REQUIREMENTS

There are essentially three basic requirements for diving fitness: (1) mental; (2) physical and (3) social fitness:

Mental fitness

The diver must be:

- conscious and alert enough to participate in the activity
- intelligent enough to be trained to do so
- psychologically/emotionally stable enough to apply the training and follow rules

Physical fitness

The diver must be:

- able to equalise air spaces (i.e. ears, sinuses, lungs, teeth, intestines) without problems
- free of incapacitating illness and injuries or risk thereof
- able to maintain exercise levels required for diving
- able to wear and use diving equipment effectively and safely

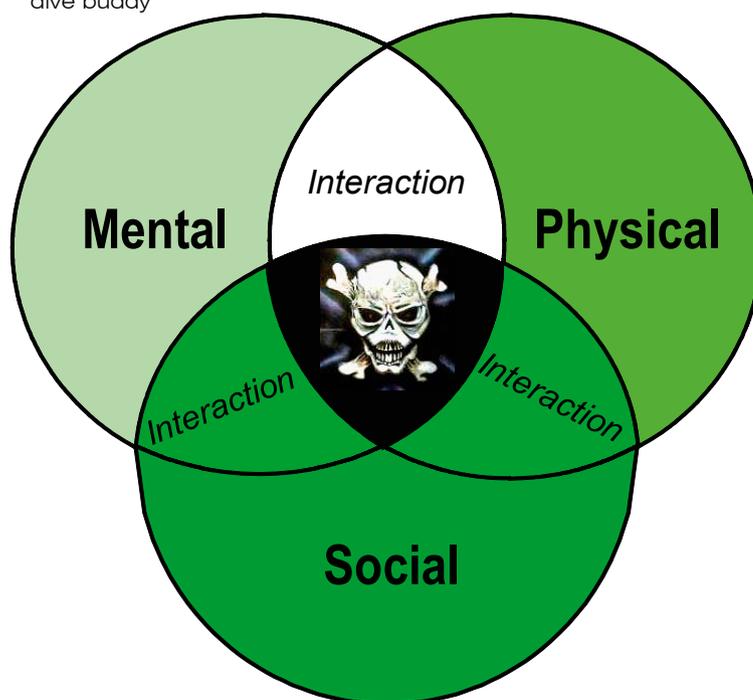
Social fitness

The diver should:

- not impose undue liability to the dive school, operator or instructor
- be able to meet their responsibilities as a dive buddy

THE MOST COMMON RISKS are related to the physical requirements. For the most part, physical fitness is based on:

- whether exposure to changing pressure may be harmful, and
- whether the individual is able to respond to, and exercise within, the diving environment without undue risk.



“

With few exceptions, divers are no longer medically disqualified from diving on the basis of medical diagnosis alone. Previously diabetes, asthma and epilepsy were grounds for immediate disqualification. Today diving fitness assessment takes the form of a more methodical risk assessment.

”

The most common risks are related to the physical requirements. For the most part, physical fitness is based on (1) whether exposure to changing pressure may be harmful and (2) whether the individual is able to respond to, and exercise within, the diving environment without undue risk. Although by no means exhaustive, for each of these two physical requirements, a number of diseases are listed where fitness cannot be assumed without proper assessment.

Pressure issues

- Middle ear infections
- Ear drum perforations
- Sinusitis
- Pneumothorax
- Asthma
- Bronchitis
- Upper respiratory tract allergies
- Hay fever
- Poor dental fillings
- Ear plugs
- Hollow false eyes
- Responsiveness to and exercise tolerance within the environment
- Epilepsy
- Fainting
- Cardiac arrhythmias
- Hypertrophic obstructive cardiomyopathy (thickened heart muscle)
- Aortic valve stenosis
- Coronary artery disease
- Cardiovascular fitness
- Anti-hypertensive medication
- Obesity
- Asthma
- Peripheral vascular disease
- Muscular dystrophy
- Mitral valve stenosis
- Thyroid disease (hypothermia)
- Diabetes
- Psychiatric disturbances
- Medication
- Physical disabilities
- Extreme motion sickness
- Balance and co-ordination problems
- Neuromuscular dysfunctions
- Adrenal disease
- Physical disabilities and equipment misfit
- Raynaud's disease
- Peripheral vascular disease
- Vasculopathies (bloodvessel disorders)
- Balance and co-ordination problems, (including Menière's disease)
- Thermal adaptability problems (including thyroid disease)

MATCHING DIVING TO FITNESS

Diving fitness is not absolute; it should be matched to the planned diving activity. For instance, some dives are inappropriate irrespective of very high levels of fitness whereas

others are low risk for even partially disabled individuals.

When diving fitness is impaired, safe and appropriate diving may still be performed by limiting:

- Exercise and exertion
- Exposure (heat and cold)
- Elaborate or extraneous equipment (technical)
- Extremes (depth, duration, decompression stops, distance)
- Decompression stop diving
- Cave/ice
- Trimix/deep air
- Strong currents/high seas
- Shore entry
- Tough boat launches

It is to be noted that a certain minimum level of physical fitness must be present to deal with sudden changes in environmental conditions or emergencies.

Armed with these perspectives we hope that it will be easier to understand and explain the importance of diving fitness and to identify when and how medical conditions may affect an individual's safety.

When in doubt, call DAN on 0800 020 111 for more information. **AD**

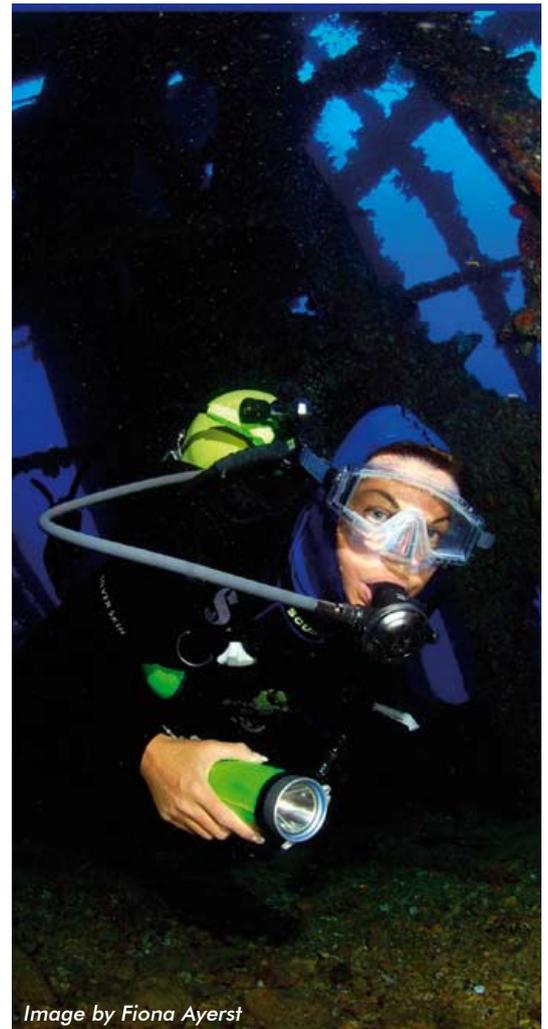


Image by Fiona Ayerst

SONY

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Marine pack

Images Shot with the Sony Cyber-shot DSC-T77 and MPK-THG Marine Pack. Photos courtesy of Fiona Ayerst: www.fionaayerst.com

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- Optical Super SteadyShot: CZ, Face, BIONZ™ Engine
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- Underwater Mode
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Sony's new ultra-light MPK-THG houses two of Sony's latest Cyber-shot T-Series cameras - the DSC-T77 and the DSC-T700. Both cameras boast superb features like 10.1 Mega Pixel still images, Touch Screen LCD's and Sony's unique underwater shooting modes.

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Includes: Two Luxfer Jumbo-D cylinders, 1600 Pelican waterproof case, brass multifunction regulator, demand valve with hose, oronasal resuscitation mask (DAN pocket mask), hand-wheel with chain, non-rebreather mask, silicone Tru-Fit mask. Dimensions: 61.6 cm X 49.3 cm X 22 cm; Weight: approximately 6.4kg (case only); Delivery time: 120 minutes.



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Includes: Irrigation syringe, eye wash, alcohol-free wipes, butterfly suture strips, wound strips, dressing, eye pad, conforming gauze bandage, adhesive tape, triangular bandage, EMT shears, disposable razor, safety pins, cold compress, heat compress, isothermic blanket, infectious waste bag, latex gloves and a resuscitation barrier device. All these components are packaged in an underwater HPRC waterproof case. Dimensions: 24 cm x 19 cm x 11 cm (small case).

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This First Aid Kit provides the same contents as the DAN first aid kit but also includes a SAM splint and DAN pocket mask in a bigger case. Dimensions: 34 cm x 29 cm x 16 cm.

SAFETY SUPPLEMENTS

ASSESSMENT OF DIVING MEDICAL FITNESS FOR SCUBA DIVERS AND INSTRUCTORS

Every diver must take responsibility for the risks inherent to diving, and medical issues are no exception. *Assessment of Diving Medical Fitness for Scuba Divers and Instructors* provides divers, instructors and other dive professionals with information and guidelines on assessing the medical fitness of prospective divers. Written in collaboration by Dr Peter Bennett (DAN's founder), Dr Frans Cronjé and Ernest Campbell, *Assessment of Diving Medical Fitness for Scuba Divers and Instructors* explains in layman's terms the principles behind medical considerations and why some questions and conditions absolutely require input from a diving physician. Appropriate for divers of all levels, the book is designed to provide advice in an understandable way so that every diver may have a reference to use as a basis for considering his or her diving medical fitness.



THE DAN GUIDE TO MEDICAL FREQUENTLY ASKED QUESTIONS (FAQS)

"Will a root canal affect my diving?" "Is a deviated nasal septum a reason not to dive?" "I'm on medication for depression. Should I not do scuba?" The answer to these and many other queries are available in this illustrated 232-page guide, compiling articles written by DAN medics and specialists in various fields addressing topics ranging from bone fractures to heart problems to "mask squeeze". This quick reference of the basic facts behind medical conditions and diving includes a thorough discussion of what decompression illness encompasses, with eight cases reflecting various DCI scenarios reported to DAN over the years and an index to locate references for various medical conditions.

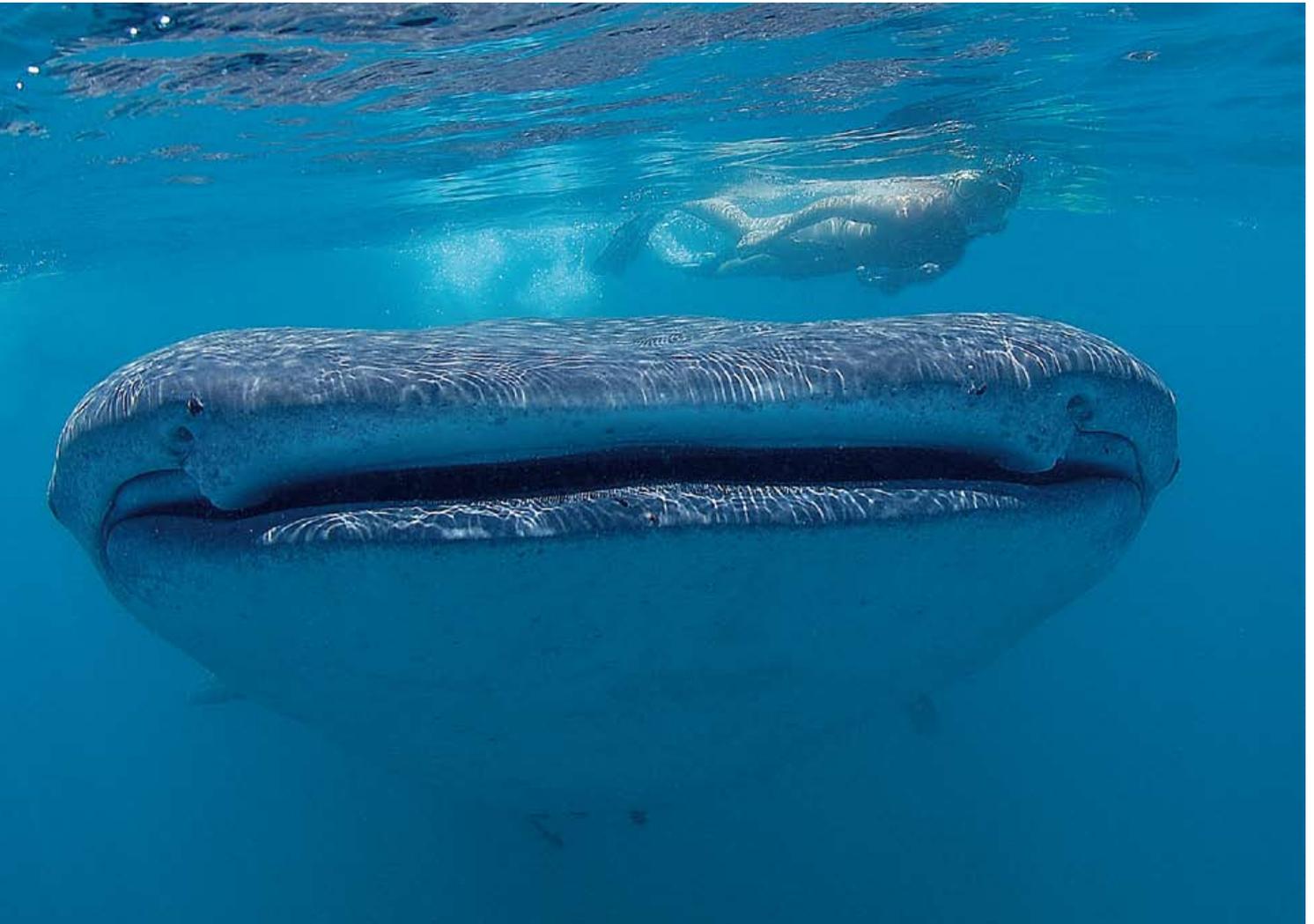
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Written by DAN's own Dan Orr and Eric Douglas, *Scuba Diving Safety* offers insightful information to help you stay safe in unexpected situations (or avoid them in the first place). Covering topics ranging from preventative planning to having to execute assistance, *Scuba Diving Safety* will become a valuable diving companion.

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WHALE SHARK SURPRISE



DAN member Sean Sequeira sent in the first *Alert Diver Parting Shot*. This is what he has to say...

“

I recently embarked on a relaxing dive trip to Ponta Malongane hoping to see a whale shark. After numerous dives and no sight of a whale shark I prepared for my last dive that Saturday. After encountering many colourful parrotfish and moray eels, I surfaced. As I got onto the boat I spotted a beautiful whale shark not far from the boat. I jumped into the water hoping to catch a glance of this wonderful creature and before I knew it, he was swimming directly towards me. I managed to get a few shots of this encounter which I shall treasure. What a sight!

”

***Parting Shot* gives you a chance to share your interesting dive stories and images with us.**

Have you encountered a rare or exciting activity underwater and captured it? Has an underwater event just added that something extra to your dive and you have a photo? If so, all you have to do is send through your high resolution image (300 DPI) along with your story (including a brief description of your creature, location of dive site and pertinent photo information) and contact details to partingshot@dansa.org and your submission could appear in the next edition of *Alert Diver!*

All images submitted for the *Parting Shot* become the property of DAN.

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Japan Marine Recreation Association

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+61-8-8212-9242 (outside Australia)

DAN / DES New Zealand

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6758-1733

DAN Asia-Pacific - Philippines

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