Continuing professional development

2010/1 Dysbaric osteonecrosis (DON), decompression illness and the diver

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Accreditation statement
To complete a course successfully, 80% of questions in each quiz must be answered correctly. Activities published in association with Diving and Hyperbaric Medicine are accredited by the Australia and New Zealand College of Anaesthetists Continuing Professional Development Programme for members of the ANZCA Diving and Hyperbaric Medicine Special Interest Group under Learning Projects: Category 2 / Level 2: 2 credits per hour.

Intended audience
The intended audience consists of anaesthetists and other specialists who are members of the ANZCA SIG in Diving and Hyperbaric Medicine. However, all subscribers to DHM may apply to their respective CPD programme coordinator or specialty college for approval of participation.

Objectives
The questions are designed to affirm the takers’ knowledge of the topics covered, and participants should be able to evaluate the appropriateness of the clinical information as it applies to the provision of patient care.

Faculty disclosure
Authors of these activities are required to disclose activities and relationships that, if known to others, might be viewed as a conflict of interest. Any such author disclosures will be published with each relevant CPD activity.

Do I have to pay?
All activities are free to subscribers.

Answers should be posted by e-mail to the nominated CPD co-ordinator (for members of both SPUMS and the ANZCA Diving and Hyperbaric Medicine Special Interest Group, this will be Associate Professor Mike Bennett, <M.Bennett@unsw.edu.au>). On submission of your answers, you will receive a set of correct answers with a brief explanation of why each response is correct or incorrect. Successful undertaking of the activity will require a correct response rate of 80% or more. Each task will expire within 24 months of its publication to ensure that additional, more recent data have not superceded the activity.

Key words
MOPS (maintenance of professional standards), diving, scuba, dysbaric osteonecrosis, decompression sickness, decompression illness,

Practitioners are referred to the article in the last issue (Gempp E, Blatteau J-E, Simon O, Stephant E. Musculoskeletal decompression sickness and risk of dysbaric osteonecrosis in recreational divers. Diving and Hyperbaric Medicine. 2009; 39(4):200-4.) and the relevant chapter (11.2) in Bennett and Elliott’s physiology and medicine of diving, 5th edition, for a discussion relevant to the exercise below.

Question 1: Which of the following is not a recognised long-term effect of compressed-gas diving?
A. Juxta-articular sclerotic areas and linear opacities on X-ray
B. A modest increase in vital capacity of the lungs, but not of forced expiratory volume in one second
C. Development of dysbaric osteonecrosis (DON) in divers never treated for decompression illness
D. Neurocognitive deficits
E. Fractures through necrotic subchondral bone

Question 2: Risk factors for DON include
A. A history of frequent long and deep dives, even with the use of good decompression practices
B. A patent foramen ovale
C. Obesity
D. High alcohol intake
E. Decompression illness

Question 3: Differential diagnosis of DON includes
A. Osteoarthritis
B. Avascular necrosis secondary to hypofibrinolysis
C. Bone islands on routine bone survey
D. Paget’s disease
E. Decompression illness

Question 4: Concerning the diagnosis of DON, which of the following is the least accurate statement?
A. Stage 3 lesions are often indicated by the onset of pain and dysfunction
B. Stage 1 lesions are only rarely discovered because they are painless, radiologically undetectable and relatively short-lived
C. MRI is the most sensitive diagnostic procedure available after Stage 1
D. Scintigraphy is likely to provide the best evidence of a lesion in Stage 1
E. Stage 4 lesions can be distinguished from other causes of osteoarthritis by observation of marginal osteophytic proliferation

Question 5: Concerning the treatment of DON, which of the following is the least accurate statement?
A. Cessation of diving on first detection may modify the subsequent development of DON lesions
B. Joint replacements are not indicated for DON as continued bone infarction renders them quickly loose and requiring revision
C. Early recompression for musculocutaneous DCS may reduce the risk of subsequent DON
D. Patients with bone infarctions may have an increase in pain on compression
E. No specific therapy that has been shown to improve the prognosis of DON once established
Book reviews

Proceedings of the Fifteenth International Congress on Hyperbaric Medicine
Jordi Desola, editor

Hardcover, 300 pages
Barcelona: SUB-HELP; 2008
Available from the publisher: <http://www.sub-help.com>
Price: Euro 65 (excluding p&p)

Every three years, the International Congress on Hyperbaric Medicine (ICHM) brings together clinicians and scientists from more diverse geographical and institutional origins than is usual for the various annual society meetings. This results in an eclectic mix of presentation types and subjects that is always stimulating, if sometimes variable, academic experience. Invariably, some papers are presented on the use of hyperbaric oxygen in conditions not considered standard elsewhere, and some unusual clinical or scientific ideas are explored, which is always a useful intellectual challenge for those whose experience is limited to working within a list of ‘accepted indications’.

The 2005 congress was a well-attended and very rewarding meeting held in one of the world’s finest conference destinations, Barcelona, Spain. It was organised as a joint ICHM/EUBS meeting and this volume of the proceedings records the majority (76) of the presentations and posters from the joint main meeting.

There is a tradition of the proceedings of each ICHM congress being published in book form and Jordi Desola, President of the 2005 congress, has brought these proceedings to print with the financial support of the international hyperbaric medicine community. The book is in the same size format as all other ICHM proceedings from the eighth meeting on, but it will stand out on the bookshelf as a result of having its covers printed with the eyecatching blue artwork that was the signature of the Barcelona congress.

The format in which the different presentations are printed varies throughout the book, presumably depending upon the material available. In some cases there is detailed text, in others abstracts only, and in many the poster is reproduced, mostly in colour. The colour and print quality is good but the readability of the posters varies, with some authors having apparently submitted low resolution files. Most are readable, however, but a large magnifying glass is an essential item for reading those posters with smaller print.

Proceedings may seem to have limited appeal in the years following, as the more scientifically important papers should be either published in peer-reviewed journals or superseded by new work. The value of ICHM proceedings often lies in material that would not so readily find its way into other types of publication, however. Useful clinical perspectives, ideas for research, rare but important observations, historical origins and truths long-forgotten are included. There is, therefore, much to be gained from periodically re-reading the material published therein and this volume is no exception.

Hyperbaric physicians and hyperbaric facilities will benefit from having the ICHM proceedings sit in their library. Researchers and literature reviewers should also ensure they have access, for ICHM proceedings often contain relevant presentations that do not get re-published and which can be usefully referred to. For those primarily interested in diving medicine and physiology, this particular volume should not be overlooked based upon the “Hyperbaric Medicine” title—about half of the papers are on diving-related subjects, and there is much of interest here.

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Key words
Hyperbaric oxygen, underwater medicine, medical society, meetings, book reviews

The database of randomised controlled trials in hyperbaric medicine maintained by Dr Michael Bennett and colleagues at the Prince of Wales Hospital Diving and Hyperbaric Medicine Unit is at:
<www.hboevidence.com>
Another Whitstable trade
An illustrated history of helmet diving
John Bevan

Hard cover, 436 pages
ISBN 0-95082242-5-9
Gosport, UK: Submex Ltd; 2009
Available from Submex Ltd: <www.submex.co.uk>
Price: Aus$150.60, £66.50 in UK, £72.00 in Europe (includes postage and handling)

To those SPUMS and EUBS members with an interest in diving history, John Bevan needs no introduction. Many will have read The Infernal Diver and will be familiar with his founding of the Historical Diving Society. Equally, those of us with a military and commercial diving background are familiar with The Professional Diver’s Handbook and his world record dive in 1970 to 1,500 feet. So, when the press release for Another Whitstable Trade arrived in my inbox and the Editor asked if I’d like to review it, I jumped at the chance.

Whereas The Infernal Diver was a history of John and Charles Deane’s invention of the diving helmet, Another Whitstable Trade follows the development of the diving industry that sprang up as a direct result of this invention. The Deane brothers lived in Whitstable, a small town on the southern coast of the Thames estuary, famous for its oyster beds. Given its proximity to London and the many shoals of the Thames estuary, it was only natural that the fledgling diving industry should make its start in Whitstable, dealing with the many wrecks in the area because of the treacherous local waterways. The first section of the book is a chronology of a series of diving ‘eras’ in Whitstable. At the end of each era, Bevan has added a section on what was happening elsewhere around Britain and overseas.

The second section is a history and description of the major organisations utilising divers. Not surprisingly the military features heavily, with first the Royal Engineers and then the Royal Navy in the UK training and employing divers. However, salvage was one of the main tasks for the early working divers and the Liverpool Salvage Association features in this section along with Trinity House and the Admiralty Salvage Section. Trinity House features heavily in the book, but it is not until halfway through that we get to understand why this is. This may be because John is expecting a mainly English readership; for the non-English amongst us, Trinity House is responsible for the upkeep of all navigation aids in UK waters—buoys, beacons and lighthouses—and removing hazards to navigation. Consequently they were heavy users of the early working divers.

The third section deals with civil engineering applications, rivers, canals, harbours, docks, bridges and tunnels. An excellent way to read this chapter, which deals with some incredible projects, is to have Google Earth open on your computer beside you to have an aerial look at the sometimes immense breakwaters constructed largely with manual labour over 120 years ago.

Next, we have a history of the major diving equipment manufacturers. Starting with Augustus Siebe, this equally fascinating section looks at the different companies’ individual advances in equipment design, with histories of each company’s major personnel. It is interesting to note that despite the number of patents taken out, as soon as one company made an improvement, it was eagerly copied by the rest.

We are then treated to a wonderful look at a selection of notable divers. I am not going to name them here; you need to buy the book. Suffice to say, the exploits of this hardy bunch are hard to believe, especially for someone who has been a working diver. While reading of the globetrotting exploits of these early divers, I was struck by the realisation that, for the commercial diver, little has changed. For today’s diver, global travel is a matter of course to chase employment and a project, just as it was in the 1800s. Last but not least is a section on diving physiology and medicine. This is not the sort of chapter you would be used to; rather, it is a look at how little was known in the mid to late 1800s. Divers complained of rheumatism; they died of apoplexy; some were paralysed (literally!) by the cold.

Undertaking the research for this book would have been a Herculean task and, as John himself states, it is bound to be incomplete. However, he is to be commended for the incredible amount of work put into this publication. Beautifully bound, with an embossed dust cover, what really stands out is the large number of quality illustrations dating from the time covered in the book. Tracking down all of those must have been a huge task.

If I have one complaint, it is that the book would have benefited from a professional proof reader. There are a number of minor mistakes, missing letters, etc, which detracted from my enjoyment of what is otherwise an excellent read. Others less picky than me may not even notice. Having said that, I would heartily recommend this excellent publication to anyone with an interest in diving history. The review copy is number 147 of a first edition of 750, so I would get online at <www.submex.co.uk> and order your copy as soon as possible.

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Key words
History, diving industry, diving at work, military diving, equipment, salvage, book reviews