

Diving Medicine Policy intent suggestions June 28_2018

The comments below relate to medical aspects of offshore diving. These follow further consideration and discussions with diving industry experts.

Given the challenging circumstances in the Canadian offshore diving environment, the emphasis must be upon achieving medical standards at least equivalent to those in the UK and Norway. The only potential at present for achieving these standards within Canada is the Diploma in Hyperbaric Medicine (Diving Medicine stream). Neither the list of physicians made available by the Diver Certification Board of Canada (DCBC) nor the Canadian Standards Association (CSA) descriptions of physician levels are adequate for ensuring medical assessment of offshore divers or coverage of diving operations.

Given that the regulations for offshore diving in Canada may not be further revised for a prolonged period of time it would be a significant mistake not to incorporate the need for the Canadian Diploma into the regulations. It is the only suitable method of physician certification available and as it becomes established it is to be anticipated that it will be respected worldwide. This is the only type of physician recognition for which there is potential for reciprocity with other jurisdictions such as the UK and Norway. It is anticipated by the Specialty Committee of the RCPSC that there will be at least 4 – 6 physicians (perhaps more) certified in the diving medicine stream by the time the new regulations are implemented and that these physicians will be located across Canada, from BC to Newfoundland. If greater assurance is needed with respect to physician availability for medicals then it would also be reasonable to delay the date for the Diploma being mandatory for Canadian dive medicals for two years beyond the implementation of the regulations (delay from 2020 to 2022). This would be a much better approach than omitting the Diploma requirement if there are any concerns. However, as will be seen below, concerns on these matters may be sufficiently allayed by accepting medicals from the UK and Norway.

Industry has been made aware of differences between the UK Health and Safety Executive (HSE) and Norwegian systems compared to the new Canadian Diploma in Hyperbaric Medicine (Diving). Essentially, the Diploma is awarded as a recognition of competence already acquired. Medical records are scrutinized before the Diploma is awarded. Multiple different types of clinical experiences are required and applicants must demonstrate these have been managed to a high standard. They must have clinical experience of assessing divers and treating decompression illness. Documents submitted by applicants are reviewed by Assessors that are experts in diving medicine. There must also be separate referees familiar with the practice of the applicants (for Practice Eligibility Route) or detailed input from the Director of a training program. Applications are independently reviewed by the Credentials Committee of the Royal College. It is a very thorough process that is designed to prevent conflicts of interest affecting the outcome.

The HSE system is different. An individual can be approved to assess and treat divers even with no experience whatsoever. They need only attend a course (somewhat longer for providing medical coverage). The Diploma is a certification of competence and experience. The HSE does have a system to audit dive medicals and only permits physician training only where there is a need for the service. This is done in order to limit physician numbers as a mechanism to help ensure that Approved Medical Examiners of Divers (AMED) continue to undertake at least 5 diver medicals each year. With the Diploma, there is no automatic auditing of records (but this can be done through a variety of routes if concerns arise) but more extensive scrutiny when it comes to awarding the Diploma. The HSE system

takes a regulatory approach. The Diploma approach is to ensure high standards of physician competence. The HSE mandates a number of tests and actions since there may be less assurance of physician expertise. These differences arise from the fact that the Royal College is a medical training and certification agency whereas the HSE is a regulatory branch of Government. The Diploma requires documentation of on-going education and therefore treats diving medicine like any medical specialty. There isn't a mechanism to mandate any particular type of test or management unless this is incorporated into the new regulations, however, this would be unwise. The HSE mandates a number of medical aspects indirectly, by referring to different guidance documents such as the MA1, rather than putting specific medical requirements into the regulations. This enables updating without a change in the regulations.

Industry should feel confident that the new Diploma in Hyperbaric Medicine (Diving) will serve the needs of offshore diving well, and not only will there be physicians available to assess and manage divers in Canada, but that the standards of those physicians will be the best available anywhere in the world.

The wording below in red is suggested for consideration, please review. Wording in black or green are possible interpretations and considerations.

For the Medical examination of divers:

The medical examination must be performed by a Diving Physician Examiner (DPE) with the Diploma in Hyperbaric Medicine (Diving Medicine stream) from the Royal College of Physicians and Surgeons of Canada **or equivalent from the UK HSE or Norway**. The most recent diving medical assessments must be made available by the diver to the Diving Physician Specialist (DPS) that is providing medical coverage to the diving operation. The DPS may require additional examinations and testing if necessary to confirm fitness.

To assist with interpretation, the words **or equivalent** should be taken to mean a physician under the auspices of the UK Health and Safety Executive (minimum AMED – Approved Medical Examiner of Divers), Norwegian authorities or other jurisdictions with reciprocity for this purpose with the UK and Norway. For clarity, physicians on the list of physicians maintained by the Diver Certification Board of Canada or physicians that have taken courses intended to meet Level 1 of the CSA Standards are not considered equivalent unless they also have the Diploma from the RCPSC.

Consider:

To assist with interpretation, the words **or equivalent** may also be taken, up until January 2022, to mean a physician that is eligible to apply for the Diploma and satisfies the training and experience requirements for the Diploma. Commencing January 2022, Canadian Diving Physician Examiners must have the Diploma (Diving Medicine stream) from the Royal College of Physicians and Surgeons of

Canada. (Note: it is clear that DPE refers to a physician licenced in Canada. Physicians in other jurisdictions considered equivalent are not expected to be licenced in Canada.)

Note: The regulations may not be revised for decades. It is important to set the standard at this time, but if there is concern that there may be insufficient DPEs then additional time could be provided for physicians to obtain the Diploma certification. However, there are no reasons for concern that there will be insufficient physicians available for the planned implementation date of late 2020. It is sufficient to have 4 or 5 DPEs in Canada. The Specialty Committee for the Diploma has physicians from Victoria BC to St. John's, NL. There are expected to be Diploma physicians (Diving) in BC, Ontario, Quebec, Nova Scotia and Newfoundland and Labrador within the next 1 – 2 years, and applications have commenced. For example, diving physicians with the Canadian armed forces and physicians associated with hyperbaric chambers and the provision of medical coverage for commercial diving operations are actively involved with the Diploma committee and are expected to apply. Nevertheless, if it is felt that additional time is needed for compliance then 2 years should be ample.

For the Medical coverage of the diving operation:

Medical coverage must be provided or led by a physician qualified as a Diving Physician Specialist (DPS).

For clarity, the words **provided or led** should be understood to mean that there must be a DPS (or equivalent) with primary responsibility but that trainees for the Diploma and DPEs may participate in the medical coverage when overseen or supervised by a DPS.

Consider:

Until January 2022, medical coverage may be provided or led by a physician with **equivalent training and experience** as a DPS, and licenced in Canada. Note: There is no reason to believe this is required but this would allow additional time for interested physicians to obtain the Diploma.

To assist with interpretation, the words **equivalent training and experience** should be taken to mean a physician that is eligible to apply for the Diploma and satisfies the training and experience requirements for both the Diploma and the DPS.

Submitted by:

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Offshore Saturation Diving Medicals and Medical Coverage

Dr. Ken LeDez

June 2018

4 x 5 = 20

Conflicts of interest

- I do not have any contract, shares of, or receive any regular salary from AOMS or any other Occupational Health company
 - Fee for service when providing coverage for offshore diving
 - Minimal income from dive medicals
- For medical services related to injuries or illnesses that are covered by the public health service I am paid on a fee for service basis
- No direct income from CAPP, any petroleum company, any diving company
- No income or compensation of any type from the Royal College of Physicians and Surgeons of Canada
- No income from providing diving medicine courses
- Earn large majority of income from work at hospital (anesthesiology, hyperbaric medicine)

No conflicts of interest

Qualifications and experience

- Medical degree University of Dundee, Scotland
- MB ChB, FRCPC
- Specialist anesthesiologist (FRCPC) – Royal College of Physicians and Surgeons of Canada
- Hyperbaric Medicine since 1986 (University of Toronto Fellowship)
- Research fellowships, multiple scientific publications
- Recognized by the CNLOPB as a Specialist in Diving Medicine since 1992
- Multiple national / international diving medicine courses and presentations

Qualifications and experience

- Founder of the Canadian Undersea and Hyperbaric Medical Association (CUHMA – formerly the Canadian Chapter of the Undersea and Hyperbaric Medical Society)
- Gas analysis – ISO accredited laboratory for diving breathing gases
- Coverage of the vast majority of Canadian offshore saturation diving for over 25 years
 - Numerous medical issues in divers
- Associate Professor, Faculty of Medicine, Memorial University
- Book author
 - Gas bubble dynamics in the human body
 - Guide to safe diving and diving emergencies
 - Chapter related to gas bubble disease in neurology textbook

Qualifications and experience

- Diving medicine training in numerous international locations including HSE course in the UK
- Saturation diving medicine training with Dr. David Elliott (HSE Diving Medicine Physician), in Freemantle, Australia
- Medical Director, and set up Hyperbaric Medicine Service at Health Sciences Centre, St. John's, NL, Canada
- Developed and delivered the first ever (in the world) medical simulation course for hyperbaric and diving medicine
 - **HETS – Hyperbaric Emergency Team Simulation**

Qualifications and experience

- Originated effort to establish Diploma in Hyperbaric Medicine from the Royal College of Physicians and Surgeons of Canada (RCPSC)
- Chair, Hyperbaric Medicine Specialty Committee, RCPSC
- Editor, principle author of the CUHMA standards of practice document

Questions

1. Is it important for the physician doing the dive medical to be experienced assessing saturation divers and knowledgeable about medical aspects of saturation diving?
2. Is it important that the physician providing medical coverage of offshore saturation diving have knowledge and expertise in this field?
3. Should **MUCH lower standards** be accepted for diving medicine in Canada compared to the UK and Norway?
4. Wouldn't having a Canadian medical, or Canadian verification of fitness be a costly inconvenience?
5. What other questions?

Concerns

1. Delays in diver medicals causing costly delays in DSV sailing
2. There will not be enough physicians with the Diploma in Diving Medicine to perform saturation diver medicals
3. Cost of dive medicals
4. Difficulty ensuring medicals up to date
5. There is too much regulation and “red tape”
6. What other concerns?

Conditions in NL (and NS) offshore compared to North Sea

- Short diving season due to extreme environmental conditions
- Greater distances for transportation, frequent fog
- Much less infrastructure (including medical infrastructure and backup)

Combining more extreme conditions, greater distances, less infrastructure AND lower medical standards could lead to serious problems

Understanding importance of different governmental structures in offshore diving medicine

- Devolution of important powers to Scotland within the UK (including healthcare)
- However, there is a unitary national government with offshore regulations by the Health and Safety Executive
- Norwegian Board of Health Supervision, Norwegian Directorate of Health
 - For diving, the physician must be recognized as a Petroleum Doctor and as a Diving Doctor
 - Specific requirements for certification, recertification, maintenance of competence

Understanding importance of different governmental structures in offshore diving medicine

- Common feature in UK and Norway are **well-established national level regulatory structures with sufficient levels of expertise to oversee medical standards, inspect diving operations**
 - Possible due to the larger scale of operations and unitary governance
- In Canada, there is confederation structure and a much smaller scale of offshore diving activities
 - No government system to oversee, approve or certify Diving Medicine Physicians
 - **No physicians employed to provide on-going diving medical advice to regulators**
 - Proposal for physician advisory method or system not incorporated into policy intent
- **Licensing** of physicians is by Provincial Colleges, not federal
- **Certification** of physicians is at federal level by two colleges
 - **Royal College of Physicians and Surgeons of Canada (RCPSC)**
 - **Canadian College of Family Physicians (CCFP)**

Diving medicals in the UK?

- National medical certification agencies are separate Royal Colleges for each specialty or area of practice (Anesthesia, Surgeons, etc.)
 - Diving medicine is too small an area of practice and physicians have not succeeded in establishing their own College or finding an existing medical College to undertake certification
 - Strong interest in the Canadian Diploma of Hyperbaric Medicine
- Many dive medicals are undertaken at **Iqarus** in Aberdeen
- HSE approval and oversight process

<http://www.hse.gov.uk/diving/amedsapproval.htm>

This section explains the approval process for Approved Medical Examiners of Divers (AMEDs) and doctors interested in becoming an AMED.

To undertake medical examinations for the purposes of the Diving at Work Regulations 1997, the doctor must have a valid 'Certificate of Approval' issued by HSE. AMEDs are accountable to HSE for the work they carry out. As a condition of approval they undertake to adhere to standards set by HSE in the regulation-specific guidance for AMEDs.

HSE Approved Medical Examiners of Divers (AMED)

Level 2D required for offshore medical coverage, somewhat longer course

Approval process

To gain HSE approval to become an AMED, you will need to meet the following requirements:

- You must be registered with the General Medical Council (GMC) and hold a licence to practise and be fully engaged with GMC revalidation. As part of your revalidation, you should ensure your AMED work is considered during your annual appraisals.
- **You must:**
 - **have a recognised qualification in occupational medicine (minimum of diploma)**
 - **a knowledge of different types of diving, diving work environments and diving medicine gained through [training](#)**
 - maintain and improve your standards by continual professional development as required by the GMC

To undertake medical examinations for the purposes of the Diving at Work Regulations 1997, the doctor must have a valid 'Certificate of Approval' issued by HSE. AMEDs are accountable to HSE for the work they carry out. As a condition of approval they undertake to adhere to standards set by HSE in the regulation-specific guidance for AMEDs.

While you must retain overall responsibility for the statutory medical examination, some elements may be delegated to nurses or occupational health technicians. However, you must ensure that the nurse or occupational health technician is suitably trained and competent. You should examine the diver and assess their fitness to dive as guided by the diving regulations, **relevant Approved Code of Practice and [MA1](#)**.

It is a condition of approval that you respond promptly to requests from HSE for information on your activities as an AMED and you promptly inform HSE of any changes in contact details. If HSE is unable to contact you, your approval may be withdrawn. You should aim to perform at least five statutory medicals a year. If you do not perform any diving medicals over a 12-month period, your approval may be withdrawn.

$$4 \times 5 = 20$$

If 20 saturation dive medicals in Canada per year, to equal the UK requirement then would need just 4 dive physicians doing these.
Note: No mechanism to track other types of dive medicals.
Aquaculture and harvesting are largest group of divers – very different to saturation diving, different jurisdictions.

How to apply for approval

You should only apply for approval if you can fully meet the requirements AND there is a demand for your services, if approved.

To apply for approval, you should complete application form [AMED02](#) and provide HSE with the following information:

- documentary evidence of satisfactory completion of your last annual appraisal, containing your name as appraisee, name of appraiser, signature of appraiser (or electronic confirmation) and date of appraisal
- a copy of the certificate of your highest recognised qualification in Occupational Medicine (minimum of Diploma)
- a copy of your current training certificate that shows evidence of specialist diving medicine ([training](#) provides further information)

Diploma in Hyperbaric Medicine from the Royal College of Physicians and Surgeons of Canada – DRCPSC

The RCPSC is the agency that certifies all medical specialists in Canada

The Diploma is part of the AFC Program (Area of Focused Competence)

- Must be certified in a primary discipline first
- Available to both specialists (RCPSC) and Family Physicians (CCFP)

Two streams, each with specific training and competence standards:

- Clinical Hyperbaric Medicine (DRCPSC (Hyperbaric) – Clinical Hyperbaric Medicine
- Diving Medicine (DRCPSC (Hyperbaric) – Diving Medicine

The Diploma could be considered as being above the highest level of Diving Medicine physician in the UK or Norway because:

1. Certification by national medical speciality certification agency that is recognized world wide for high standards of excellence – and is specific to Diving and Hyperbaric Medicine (not occupational medicine)
2. Certification of competence, not just participation in training, **mandates saturation diving medicine training**
3. Requires experience of treatment of hyperbaric treatment and management of diving medical disorders
4. Requires on-going Maintenance of Competence to maintain certification – well developed compared to GMC
5. Training programs must be accredited and are based at University medical schools with postgraduate specialty residency programs in primary disciplines

Diploma in Hyperbaric Medicine from the Royal College of Physicians and Surgeons of Canada – DRCPSC

Routes to Diploma certification:

Training program accredited by the RCPSC at a University Medical school

Practice Eligibility Route (PER) – path to Diploma certification to the same standards for physicians already in practice

What about privately offered physician training programs? No obstacles to these being used for the knowledge components of the Diploma and the continuing education requirements

Is it possible to have Royal College Diploma physicians in time for the new regulations? – about 2 ½ years from now

www.royalcollege.ca/rcsite/credentials-exams/exam-eligibility/afc/apply-afc-practicing-e

<http://www.royalcollege.ca/rcsite/credentials-exams/exam-eligibility/areas-focused-competence-afc-diploma-e>

<http://www.royalcollege.ca/rcsite/credentials-exams/exam-eligibility/afc/qualifying-for-area-focused-competence-afc-diploma-e>

<http://www.royalcollege.ca/rcsite/credentials-exams/exam-eligibility/afc/afc-ediploma-requirement-e>

MOC

How many are needed to examine ALL the saturation divers in Canada? - At least 1, preferably 2 – 5, but less than 10

<https://login.royalcollege.ca/oamlogin/login.jsp>

If more than 10 there is no opportunity to maintain physician experience at the level required by HSE

However, no mechanism to limit the numbers

CSA Diving Physician Levels

General descriptors only

The CSA does NOT:

- Approve or certify physician courses
- Approve or certify physicians
- Maintain a list of diving physicians
- Provide a detailed curriculum, training, or competency standards
- Verify physician qualifications or licensing
- Verify on-going training or continuing professional development

Diploma = CSA Level 2 Diving Physician (I wrote / modified both!!)

For inshore / provincial diving, it is accepted that CSA Level 1 (below Diploma) is sufficient

Key question: Should Diploma / Level 2 be required in Canada for offshore / saturation diving

Level 1 CSA does not meet the standards of the HSE or Norwegian authorities – there is no certification, verification of training, experience, competence, on-going professional development or any form of oversight

DCBC list of physicians - useless

Diver Certification Board of Canada is a private organization that certifies divers, not physicians

CMPA – Canadian Medical Protective Association – liability insurance for physicians. CMPA gave clear advice to CUHMA and others:

- Do not certify or approve or list physicians for diving medicine
- Will not provide legal coverage for liability arising out of problems related to physicians or inadequacy of medical evaluation of divers to CUHMA, individual physicians or other organizations

DCBC is not a medical or governmental organization and does NOT:

- Provide or approve or certify physician courses
- Approve or certify physicians
- Provide a detailed curriculum, training, or competency standards
- Verify physician qualifications or licensing
- Verify on-going training or continuing professional development

Already been an examples of a provincial medical licensing authority investigating and finding a physician had not undertaken any type of hyperbaric or diving medicine training

Between the Diploma in Diving Medicine and the DCBC / CSA
there is.....

→ **NOTHING!!** ←

Exception: There is a “patchwork” variety of different processes for each Provincial jurisdiction of variable effectiveness, all with very limited or no oversight

Reasonable alternatives to requirement for Canadian dive medical by a Diploma certified physician (must at least equal HSE medical).....

HSE (or Norwegian) medical PLUS access to medical records (mechanism for access to be determined)

Downside of HSE / Norwegian medical:

- Current lack of reciprocity – means that likely to lead to ALL medicals being HSE or Norwegian since majority of work is outside of Canada (nevertheless, reciprocity should be a goal)
- Lack of Canadian diving medicine expertise / experience, will lead to difficulties with succession for physicians providing medical coverage – **medical coverage more difficult if no experience of diver medicals**
- Limited access to medical records – numerous jurisdictional issues and varied privacy laws

However, MUCH better than DCBC / CSA informal, unverified “non-system”

Why a Canadian medical?

- Physician licensed in Canadian jurisdiction – legal to prescribe and treat
- Access to other specialists when needed
- **Access to medical records facilitated**
- Physician must have knowledge and experience of saturation divers
 - No way to ensure that unless restrict number of physicians doing the medicals – **just as is done in the UK and Norway**
 - HSE and Norway physicians meet a acceptable standard, reasonable to accept those – **but UK / Norway systems to ensure diving physician has access to previous diving medicals and other records**

Why a Canadian (or UK / Norway) medical?

- **Multiple divers involved in significant events** that had significant medical histories that were only discovered later (such as after arriving on shore, prior to return to work)
 - **Outrageous situation that does not meet expected standards of care**
 - **Evidence of “doctor shopping”**
 - **Medicals from India, Pakistan, Malaysia, elsewhere, minimal documentation and no way to verify anything**
 - **Risks to diver and others on the dive team**

Analogy: Giving an anesthetic for major elective surgery without any prior assessment of the patient, and then trying to call relatives and friends for information once there is a cardiac arrest on the operating table.

Making the medical “easy”

1. Online submission of health questionnaires
2. Upload of results of any required tests if already performed within the preceding 12 months from an approved jurisdiction
3. Uploading copy of previous dive medicals from an approved jurisdiction
4. Review of materials submitted by the Canadian diving physician
5. Decisions on need for further investigations or consultations
6. Medical examination should be brief except in cases of uncertain fitness – **could even be done on the DSV**

Cost of dive medicals and inadequate dive medicals

- The costs of inadequate medical assessment or coverage are MUCH greater than doing it right
 - Death or serious injuries
 - Inability for a dive shift or entire dive operation to work
 - Need for unplanned recompression or decompression
 - Need to return to port or evacuate divers to a medical facility
 - All of these involve substantial financial costs to the dive operation
- Medical assessment costs are trivial in comparison to other costs

Criteria for saturation diving fitness

- **Should be based on evidence and should not be arbitrary**
- **Divers must be fit to effectively undertake the required work tasks with an acceptable level of risk to themselves and others involved. Any medical conditions must be stable, appropriately managed and known to the diving medicine physician. Any restrictions must be known to and accepted by the dive team.**
- Medical goal is to keep the divers safe, available for work in the water, or at least the Dive Bell or chamber, or to safely treat and remove the diver from saturation for further assessment and treatment.

Reciprocity between Canada and Europe for diving medical fitness

- Difficult – should be sought
- The HSE requires adherence to MA1 (which is very specific to the UK)

Summary

- Canadian medical preferred by Diploma physician for saturation diving
 - Alternate if unavailable: HSE / Norway PLUS access to medical records
 - DCBC / CSA = no standard, no verification, no oversight, no use
- Canadian medical coverage of saturation diving

HSE required adherence to MA1

Some limitations, for example:

Very specific requirements for exercise testing - Little evidence to support need for this in divers (may be useful, should it be part of the medical however?)

Specific guidance on respiratory conditions, such as for blebs – but need high resolution CT scan for this and no such requirement

No requirement to check blood glucose, etc. etc.

Very specific to UK

Dive companies often expect further testing, such as exercise stress test, PFO testing if DCS

Canadian diver testing requirements

Anything goes! – no mechanism to ensure compliance

CSA requirements are probably reasonable but had little or no expert diving physician input

No mechanism to impose or verify anything

Mechanism to ensure qualifications of physicians – Diploma from the RCPSC

Most important need is for evaluation by a well qualified physician

Figure 1 Flow chart to aid interpretation of BMI and waist circumference measurements

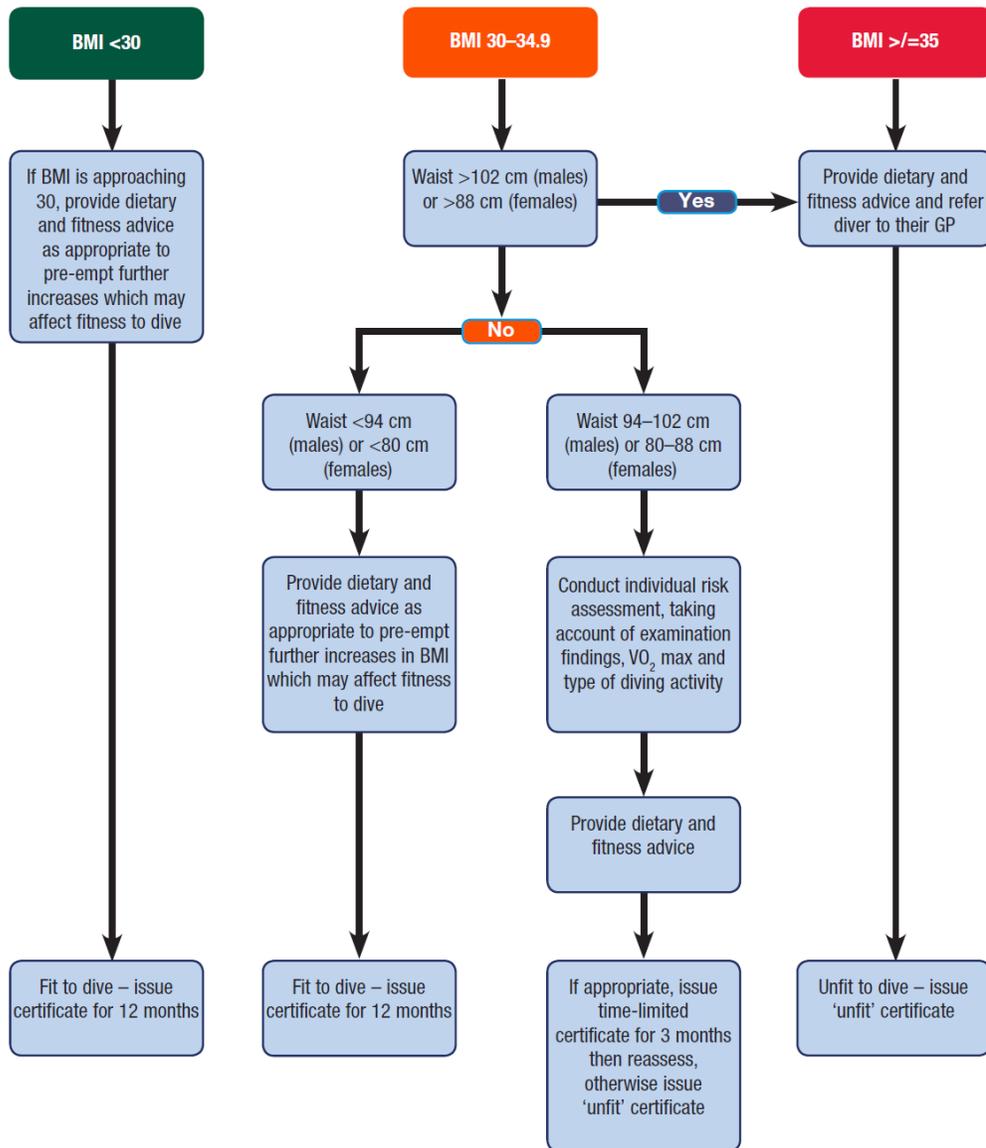
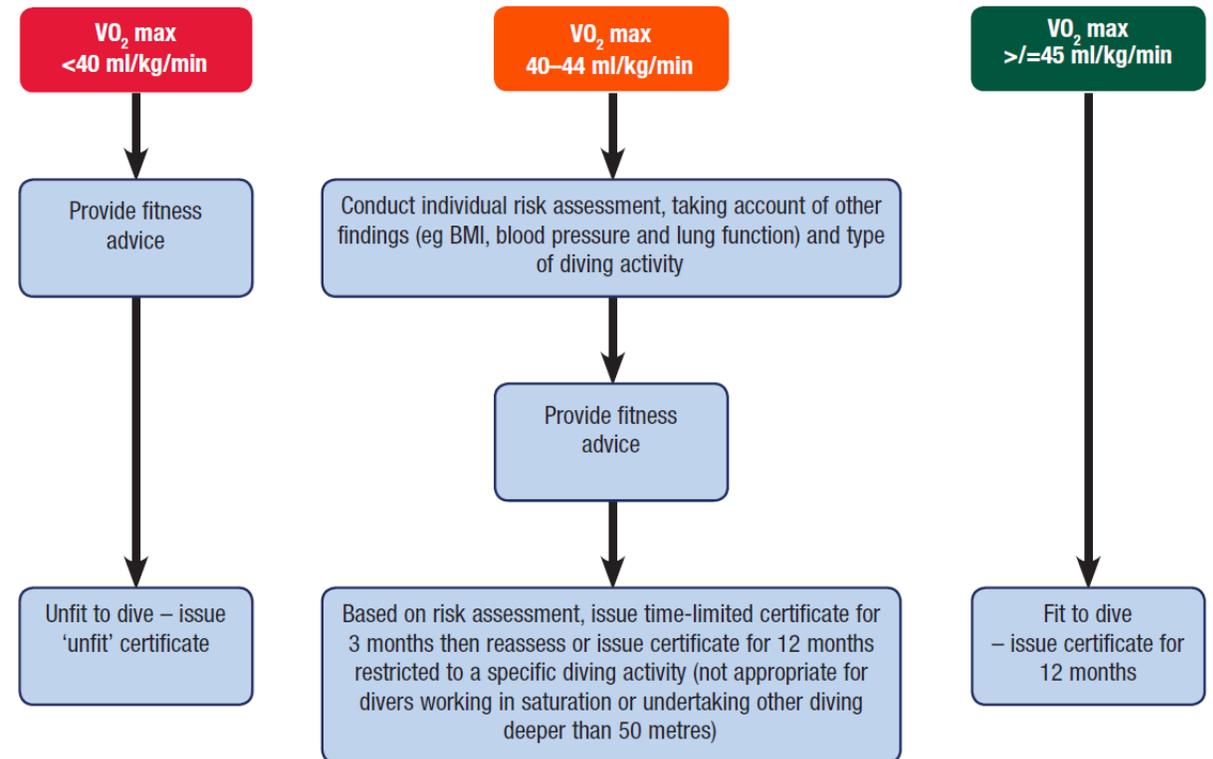


Figure 2 Flow chart to aid interpretation of VO₂ max values



Studied for firefighters, not divers

Quality versus ease of access

- A diver medical examination on every corner?
- Comparison to surgery, medical care?
 - Importance of physician that has experience?
 - Importance of facility that meets high standards?

Case histories

Importance of communications / IT