

Commander Military Personnel Command

Medical Fitness for Submarine Service and Wet Pressurized Escape Training

Document Status:	Current
Document Type:	Instruction
Document Number:	4030-71
Original Source:	CFMO 27-12
Approval:	Surg Gen
SME:	Consultant in Dive and Submarine Medicine
OPI:	RCN Med Advisor
Effective Date:	10 Jul 08
Last Reviewed:	27 Jul 15

Latest Amendment

Background

General

1. This Instruction provides guidance for conducting initial and periodic health assessments for Canadian Armed Forces (CAF) members serving onboard submarines, screening recommendations for periodic wet pressurized escape training (WPET), and direction for assigning medical categories and processing medical files for review.
2. The Canadian Forces Submarine Medicine Course is offered to medical officers and physician's assistants who have completed Advanced Dive Medicine training. Candidates successfully completing the course are designated Submarine Medical Officers (SbMO) or Submarine Medicine Technicians (SbMT).

Supersession

3. This Instruction supersedes CFMO 27-07, Service in Submarines and CMS Med Dir 02-03 and CMS Med Dir 04-01.

Application

4. This Instruction applies to all CAF personnel, Department of National Defence (DND) Public Servants, contractors and sub-contractors employed or contracted by DND to provide health services and/or health services support to entitled personnel.

General Information

Abbreviations

5. The following table contains abbreviations used in this Instruction. The accompanying definitions are for the purposes of this Instruction:

Abbreviation	Term in Full
ADMO	Advanced Diving Medical Officer
AGE	Arterial Gas Embolism
BDMO	Basic Diving Medical Officer
BSQ	Basic Submarine Qualification
CAF	Canadian Armed Forces

CDSM (C/DM)	Consultant in Diving and Submarine Medicine
CoC	Chain of Command
CFEME	Canadian Forces Environmental Medicine Establishment
CFHS	Canadian Forces Health Services
CF H Svcs C	Canadian Forces Health Services Centre
CF H Svcs Gp	Canadian Forces Health Services Group
CFB	Canadian Forces Base
CSET	Canadian Submarine Escape Trainer
CSN	Canadian Switchboard Network
DCS	Decompression Sickness
DISSUB	Distressed Submarine
DMCA	Director Military Careers Administration
D Med Pol	Directorate of Medical Policy
DMT	Diving Medicine Technician (Basic or Advanced)
DRDC	Defence Research & Development Canada
ECG	Electrocardiogram
HCP	Health Care Provider
IMQ	Institut Maritime du Quebec

MEL	Medical Employment Limitation
MOC	Military Occupation Code
MOSID	Military Occupational Structure Identification
PA	Physician's Assistant
PFT	Pulmonary Function Test
PHA	Periodic Health Assessment
SbMO	Submarine Medical Officer
SbMT	Submarine Medical Technician
SMER	Submarine Escape and Rescue
WPET	Wet Pressurized Escape Training

Definitions

Note: *Definitions are for the purposes of this Instruction.*

ADMO

6. A medical officer trained in diving medicine who is qualified to conduct diving medicals (initial and annual), assess and treat hyperbaric casualties in a hyperbaric chamber, and provide approving authority for annual diving medicals performed by other diving medical officers and DMTs.

AGE

7. A pathologic condition occurring when gas bubbles gain access to the arterial system causing blockage of blood flow and physiologic changes leading to local hypoxia and cellular death. The condition may be fatal if not treated with urgent recompression therapy.

BDMO

8. A medical officer trained in diving medicine who is qualified to conduct annual diving

medicals (which are reviewed by an ADMO), but who cannot treat diving-related casualties.

CDSM

9. A Consultant in Diving and Submarine Medicine is an ADMO and SbMO trained physician who has undergone additional post-graduate training in undersea and hyperbaric medicine. The CDSM provides expert opinion and medical support to commanders at all levels of the submarine and diving communities within the Canadian Forces.

CFEME

10. A CAF H Svcs unit co-located with DRDC in Toronto. It represents the centre of excellence in diving and aviation medicine within the CAF.

DMT

11. A physician's assistant trained in diving medicine. A basic DMT (BDMT) is qualified to conduct annual (not initial) diving medical assessments (which are reviewed by an ADMO). An advanced DMT (ADMT) is additionally qualified to work as the inside tender in a hyperbaric chamber during treatments.

DCS

12. A condition resulting from a decrease in ambient pressure, whereby dissolved inert gas (e.g. N₂, He) in the tissues and blood evolves from solution to form bubbles that interfere with normal tissue and physiologic function. Symptoms may be mild (joint pain only) or serious (involving the central nervous system).

SbMO

13. A medical officer trained in submarine medicine who is qualified to conduct submariner medicals (initial and annual), provide approving authority for submariner medicals performed by other medical officers and submarine medicine trained DMTs, and provide medical advice and treatment for casualties in a DISSUB situation.

SbMT

14. An ADMT who has completed the Submarine Medicine Course and is qualified to conduct annual submariner medicals (which are reviewed by a SbMO). He/she is also qualified to serve as a physician's assistant aboard a submarine following submariner training.

WPET

15. A submarine escape training procedure involving egress of a candidate from a submarine escape compartment through a column of water. In the CAF, WPET is conducted in the CSET at the IMQ in Rimouski, QC.

Periodic Health Assessment

Direction

16. The health of CAF submariners shall be assessed on a regular basis to ensure their medical fitness for service and deployment. All prospective submariners will undergo an initial health assessment (initial submariner medical) prior to training, followed thereafter by yearly PHAs.

Initial Submariner Medical Assessment

17. Initial submariner medicals should be performed by a SbMO whenever possible; however, they may also be done by either a BDMO or ADMO if a SbMO is not available. All initial submariner medicals must be reviewed by a SbMO for 2nd signature. If, however, the initial submariner medical was conducted by a SbMO, and no other SbMO is available for review, the medical may be approved by an ADMO. Following review of the initial submariner medical, the reviewing SbMO shall sign the '*Medical Screening Form for Service in Submarines*' (Annex A) stating that the member is either **fit** or **unfit** for submarine service, and providing his or her medical category. This should be done prior to commencing his/her BSQ course. If there are any medical concerns with respect to initial fitness for submarine service, the medical file shall be sent to a CDSM for review
18. During the initial submariner medical, candidates will be assessed regarding their fitness for pressurized escape. Candidates who are found to be 'permanently unfit pressurized escape', but who are otherwise fit for submarines, may be considered for sub service under certain circumstances. Please refer to the section, '**Pressurized Escape**' for further information on the limited circumstances which may lead to such a determination. The decision to make a submarine candidate, 'Unfit pressurized escape, otherwise fit submarine service' is to be made by a CDSM only. The decision as to whether such a candidate will be accepted for sub service will be made by the submarine CoC
19. Initial submariner medicals are valid for a period of 12 months. For operational reasons, a 60 day extension may be approved by the CDSM , the Fleet Support Medical Officer or Formation Surgeon. If, however, the member has not started his/her BSQ course within this period, they will be declared 'unfit for submarine service' until a new medical assessment has been completed.
20. Submarine-qualified members who have not served in the submarine environment for more than two years, or whose submariner medicals are no longer valid, will require a new initial submariner medical assessment.

Annual Submariner Medical Assessment

21. Following the initial submariner medical, a complete Type I PHA shall be completed for all

submariners on a biennial (every two years) basis. A detailed history and physical exam will be conducted and recorded on a DND 2033 form (Medical Examination Record). A Part 1 assessment (to include anthropometrics, BP, spirometry, audiogram and visual acuity), a DND 2452 form (Aircrew and Diver Health Examination), and DND 2552 shall also be completed at that time and reviewed by a HCP. Biennial Type I PHAs may be completed by either a SbMO or a SbMT, or a BDMO or ADMO if a submarine medicine trained HCP is not available. All PHAs must be reviewed by a SbMO (or by an ADMO if the PHA was conducted by a SbMO or SbMT and no other SbMO is available).

22. In alternate years when a complete Type I PHA is not required, a Type II PHA consisting of a Part 1 assessment (to include anthropometrics, BP, spirometry, audiogram and visual acuity), and a DND 2452 shall be completed by a SbMT and reviewed by a SbMO (or a BDMO/ADMO if a SbMO is not available) to determine whether the submariner needs to be seen by a physician. The member will also have the opportunity to see a SbMO (or BDMO/ADMO if a SbMO is not available) should they wish.

Unfit for Submarine Service

23. If a trained submariner becomes temporarily unfit for service in submarines, a temporary category and appropriate MELs shall be assigned. A CF 2033 and a CF 2088 shall be initiated, and MELs communicated to the member's unit via a CF 2018 and CF 2088. If the patient requires more than two consecutive 6 month temporary categories, the file must be reviewed by the CDSM for recommendations and possible assignment of a permanent category. A SbMO may request CDSM review for assignment of a permanent category prior to the completion of a second 6 month temporary category, as circumstances warrant.
24. A P-Cat shall be recommended by the SbMO if at any time a submariner is determined to be 'permanently unfit submarine service'. The file must be forwarded to the CDSM for consultation prior to its being sent to D Med Pol for final category assignment. If the member is considered to be 'permanently unfit submarine service', but is otherwise within the medical standards for his or her MOSID, they may be retained within the CAF and employed in a non-submarine environment. If, however, the medical assessment finds the member to be 'permanently unfit submarine service', and below the minimum medical standard for his or her MOSID, there may be an impact on their future employability within the CAF. Final category assignment shall be determined by D Med Pol, and employability within the CAF shall be decided by DMCA and/or the CoC depending on the MELs assigned.

Responsibility

Responsibility Table

25. The table below summarizes the responsibilities associated with the submariner's PHA:

The...	Is/are responsible for...
CDSM	<ul style="list-style-type: none"> • Providing consultation service and final decision on fitness for service in submarines for difficult/complex initial and annual submariner medicals, as well as for submariners who have required more than two consecutive 6-month temporary categories; • Reviewing initial, biennial Type I and Type II submariner medicals for 2nd signature if no other SbMO is available; and • Providing 60-day extension on initial submariner medicals for operational reasons.
SbMO	<ul style="list-style-type: none"> • Conducting initial and biennial Type I submariner medicals; and • Reviewing initial, biennial Type I, and Type II submariner medicals for 2nd signature.
SbMT	<ul style="list-style-type: none"> • If required, conducting biennial Type I and Type II submariner medicals (to be reviewed by a SbMO – or a BDMO or ADMO if SbMO is not available).
ADMO	<ul style="list-style-type: none"> • If required, conducting initial and biennial Type I submariner medicals if a SbMO is not available; • If required, reviewing initial and biennial Type I submariner medicals for 2nd signature if the medical was conducted by a SbMO and there is no other SbMO available for review; and • If required, reviewing Type II submariner medicals for 2nd signature.
BDMO	<ul style="list-style-type: none"> • If required, conducting initial and biennial Type I submariner medicals if a SbMO is not available
Submariners	<ul style="list-style-type: none"> • Scheduling the appropriate Type I PHA or Type II health screening process, as indicated.

Standard of Fitness

26. Candidates for service in submarines must have successfully passed the CAF FORCE Evaluation Test and must be in satisfactory mental and physical health, in accordance with this document. Candidates must also meet the minimum medical category specified for their MOSID, however, meeting this standard does not, in itself, ensure medical fitness for service in submarines. A list of '*Contraindications to Service in Submarines*' can be found at Annex B.

27. The minimum medical profile for initial assignment to submarine service shall be as follows:

Occ	V	CV	H	G	O	A
All	3	2	2	2	2	5

Age, Weight and Height

28. There are no age restrictions aside from those for the CAF in general. Weight shall be such that the candidate can easily and safely move about on a Victoria-class submarine, and egress during WPET. Minimum submarine specific height requirements are currently under development by the operational community (candidates must be able to safely move from one fitted air connection to the next). There are no maximum height limitations, though consideration should be given to the onboard comfort of potential submariners over 6'4".

Vision

29. The minimum visual category for all submariners, regardless of trade, is V3. In accordance with CFHS Instruction 4020-03, '*Optical Supply and Services: Entitlement to Contact Lenses*', the Commanding Officer, Executive Officer, Combat Officer, and Navigation Officer are entitled to gas permeable contact lenses at crown expense if required while employed in submarines.
30. Members having laser eye surgery should discuss the procedure and its implications with a BDMO/ADMO or SbMO. Members having the procedure will be unfit sea for 30-days following laser eye surgery to allow for recovery and for appropriate post-op follow-up with the ophthalmologist. They will be unfit WPET for 3 months. If there are no complications at 3 months post-procedure, the member may be made fit WPET following satisfactory review of the file by a SbMO or ADMO.

ENT

31. Both tympanic membranes (TMs) must be intact and mobile when examined during a Valsalva maneuver. Eustachian tubes must be patent. Tympanometry should be considered in cases where eustachian tube function is at question. There shall be no history of chronic ear or sinus problems.

Dental

32. A Dental Officer shall complete a dental exam. Dental caries and pathologic conditions of the gums and oral cavity may be cause for temporary rejection until treatment is completed.

Respiratory System

33. The chest must be clear, with equal air entry bilaterally, no crackles and no wheezes. There must be no history of asthma after the age of 12, and no history of spontaneous pneumothorax or penetrating chest trauma. A chest x-ray (PA – inspiratory/expiratory – and lateral) shall be carried out during the initial submariner medical (prior to the WPET). The CXR is valid for 5 years. CXR is otherwise to be performed as clinically indicated. Candidates must undergo basic spirometry during the initial submariner medical and at the time of each subsequent Type I and Type II PHA. Full PFTs, an exercise challenge, a methacholine challenge, or a eucapnic hyperventilation test should be conducted if clinically indicated.

Central Nervous System

34. A history of significant head injury (e.g. unconsciousness lasting greater than 2 minutes, skull fracture, intra-cranial haemorrhage of any type, post-traumatic amnesia of greater than 30 minutes, focal neurological symptoms, and/or post-concussive symptoms lasting greater than 24 hours) requires further evaluation to determine severity and the potential sequelae attached thereto. This evaluation (CT, MR, EEG, neurological consultation, etc.) should be conducted by the primary care physician in conjunction with a CDSM. There should be no history of seizure activity other than febrile seizures prior to age 5. Severe, disabling migraine headaches are a contraindication to submarine service. In certain circumstances, milder forms of migraine may be compatible with submarine service. In such instances, the opinion of a CDSM shall be requested prior to approval.

Mental Health

35. The examining SbMO must pay particular attention to the candidate's psychological fitness for service in submarines. Emotional maturity, stability and dependability are imperative. Candidates must be able to live in close quarters for long periods of time. An interview shall be conducted to identify indications of claustrophobia, anxiety disorders, panic attacks, depressive illness, or substance abuse. A referral for mental health assessment shall be made if warranted.

Review of Systems

36. At a minimum, the initial submariner medical shall seek information regarding the following conditions:
- ENT – chronic ear or sinus problems, tympanic membrane perforation, tympanoplasty, inner ear surgery, eustachian tube dysfunction, Meniere's disease
 - Respiratory – asthma after the age of 12, exercise or cold induced bronchospasm, spontaneous pneumothorax, penetrating chest trauma, COPD, bronchiectasis
 - Cardiac – valvular abnormality, murmur, dysrhythmia

- d. Neurologic – significant head injury causing (defined above), loss of consciousness, seizure activity (other than febrile seizures under the age of 5 years), migraine headaches, neuromotor disease, vestibular disorders
 - e. Mental Health – claustrophobia, anxiety or panic disorders, major affective disorder, psychosis, bipolar affective disorder, substance abuse
 - f. Gastro-intestinal – peptic ulcer disease, GERD, colitis, hernia
 - g. MSK – significant disorder or injury with sequelae of limited strength or range of motion
 - h. Anaemia, thyroid disorder, or Diabetes Mellitus.
37. A positive answer to any of these questions will require further investigation, and may disqualify the member from submarine service.

Investigations

38. During the initial and biennial Type I and Type II submariner medicals, the following investigations shall be conducted as follows:

Investigation	Initial	Type I	Type II	Remarks
Blood Work	X	X		<ul style="list-style-type: none"> • to include: <ul style="list-style-type: none"> ◦ CBC ◦ fasting blood sugar (BS) ◦ BUN, creatinine ◦ total cholesterol, HDL, LDL and triglycerides ◦ liver panel (AST, ALT, GGT, Alk phos)
Urinalysis	X	X		<ul style="list-style-type: none"> • monitoring for proteinuria and hematuria
Visual Acuity	X	X	X	<ul style="list-style-type: none"> • using the revised 2005 guidelines for visual acuity
Audiogram	X	X	X	<ul style="list-style-type: none"> • measured and graded according to CFP 154
ECG	X	see remarks		<ul style="list-style-type: none"> • during initial submariner medical, subsequently q 4 years until age 40, then q 2 years.

Cardiovascular screening	X	X		<ul style="list-style-type: none"> • to include: <ul style="list-style-type: none"> ◦ history of hypertension ◦ lipid profile ◦ fasting BS ◦ smoking history ◦ family history • stratification of CVS risk utilizing Aircrew Cardiovascular risk screening guidelines (FSG 600 -1) or the McGill Cardiovascular Health Improvement Program (www.chiprehab.com).
Chest X-ray	X	see remarks		<ul style="list-style-type: none"> • PA (inspiratory and expiratory) and lateral • Chest x-ray to be repeated every 5 years
Screening spirometry	X	X	X	<ul style="list-style-type: none"> • minimum requirements: <ul style="list-style-type: none"> ◦ FEV1 > 80% ◦ FVC > 80% ◦ FEV1/FVC > 75% ◦ FEF 25-75 > 50% • if spirometry values do not meet these minimum standards, full PFTs (with flow volumes) are required +/- exercise or methacholine challenge (if clinically indicated)
Long bone survey	see remarks			<ul style="list-style-type: none"> • not routinely required with two exceptions: <ul style="list-style-type: none"> ◦ if member is a deep (> 30 msw) water diver (CAF or otherwise) and has not had a prior long bone survey ◦ if member has suffered an episode of DCS in the past and did not have follow-up investigations to rule out dysbaric osteonecrosis • in the event of a pressurization accident on board a submarine all members of the crew will be screened by MRI at 2 months post event, and subsequently by plain radiography as determined by the CDSM
Complete	X	X	X	<ul style="list-style-type: none"> • conducted by a Dental Officer

dental examination				
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Women – Service in Submarines

39. Pregnant members are deemed unfit sea and unfit alongside in order to ensure the health and safety of the expectant mother and the fetus. This Instruction extends to women serving in submarines.
40. All female members posted to a submarine shall be interviewed by the submarine's PA (or a SbMO) and informed of the potential risks and complications related to pregnancy in a submarine environment. Members will then read and sign the '*Medical Advisory Statement for Women in Submarines*' (Annex C). In addition, any female submariner who believes they could be pregnant should be tested prior to deployment.

Pressurized Escape

41. WPET policy is contained in CFCD 103 - Submarine Escape and Rescue Manual. It contains specific direction on who must undergo WPET and the frequency of that training. Submariners undergoing WPET do so at the CSET located at the IMQ in Rimouski, QC. WPET is conducted during the BSQ Course, and biennially thereafter for operational submariners.
42. The likelihood of a situation requiring pressurized escape from a DISSUB is very small. The disabling of a sub is a distinctly unusual event, and rescue (v. escape) by a pressurized rescue vessel is the primary means of recovering the crew. Escape is only viable from waters less than 180 msw (metres of salt water) depth. These factors combined mean that escape is likely to be a rare occurrence.
43. During pressurized escape (as training or in a real event) the primary medical concerns are those related to barotrauma. Data from CSET indicates that approximately 38% of those undergoing WPET will experience otic barotrauma to some degree. None of the reported incidents resulted in permanent sequelae. No incidents of pulmonary barotrauma have been recorded at CSET, but other training facilities (RN, USN) have experienced several such events. During a DISSUB escape it is probable that the majority (or at least a significant minority) of escapees will suffer from otic barotrauma. The incidence of pulmonary barotrauma during DISSUB escape is not known.
44. Owing to the potentially significant consequences arising from pulmonary barotrauma, any individual predisposed to its occurrence (those with asthma, RAD, EIB, obstructive lung disease, cystic lung disease, pulmonary scarring, etc.) will generally be considered unfit submarine service. Exceptions to this rule may be made by a CDSM should circumstances so warrant. Any individual with a predisposing condition for barotrauma (either otic or pulmonary), but who is otherwise fit for submarine service, shall be referred to a CDSM. The CDSM will categorize the risk and present such information to both the submariner and

CANSUBFOR. Should both the member and CANSUBFOR choose to accept the risk, the individual may be allowed to serve on RCN submarines. Such a decision belongs to the individual submariner and CANSUBFOR, not CF H Svcs Gp.

45. Prior to departing for escape training, all submariners must be screened to confirm their medical fitness. A chest x-ray (PA – inspiratory/expiratory – and lateral) completed within the past 5 years, and screening spirometry conducted at the last Type I or Type II PHA must be within normal limits. A current Type I or Type II PHA must be on file, and a DND 2452 Aircrew and Diver Health Examination form must be completed within 60 days prior to escape training. WPET screening documentation is to be reviewed and signed by a SbMO/ADMO/BDMO prior to departure for Rimouski. Copies of these medical documents will accompany the submariner to Rimouski for review by the IMQ level-2 trained hyperbaric physician providing medical support to the CSET.
46. On the day of the pressurized tower escape, each submariner shall be re-examined by the IMQ hyperbaric physician as per Annex D, '*Medical Screening Guidelines for WPET*'. The results of this poolside screening, both pre- and post-escape, shall be documented on the '*Poolside WPET Screening and Examination Record*' (Annex E), a copy of which is to be scanned at the submariner's Health Centre and entered into CFHIS. A recompression chamber is located on-site at the escape trainer in the event that an AGE should occur during training. It is extremely unlikely that a case of DCS could develop due to the shallow depth that the submariners escape from (8m), and the short time that is spent under pressure prior to escape.

Annexes:

- A. [Annex A \(PDF, 22 Kb\)](#) - Medical Screening Form for Service in Submarines
- B. [Annex B](#) - Absolute and Relative Contraindications to Service in Submarines
- C. [Annex C](#) - Medical Advisory Statement for Women in Submarines
- D. [Annex D](#) - Medical Screening Guidelines for WPET
- E. [Annex E \(PDF, 15 Kb\)](#) - Poolside WPET Screening and Examination Record

Annex B to CF H Svcs Gp Instruction 4030-71

Absolute and Relative Contraindications to Service in Submarines

The following list consists of conditions which may preclude service in submarines. Some conditions should be considered absolute contraindications (e.g. COPD), while others may be considered relative (e.g. migraine) depending on the severity and circumstances. In all instances where there is doubt concerning the significance of the condition for submarine service, the

opinion of a CDSM should be solicited.

Respiratory

- Asthma or reactive airways disease after age 12
- Exercise or cold-induced bronchospasm
- Bronchiectasis
- Sarcoidosis
- Chronic obstructive pulmonary disease (COPD)
- Congenital blebs or bullae, or any condition with a risk of air trapping
- Spontaneous pneumothorax (cases of traumatic pneumothorax reviewed on an individual basis)
- Penetrating chest trauma
- PPD converters who have not received treatment

Cardiovascular

- History of coronary artery disease including angina and myocardial infarction
- Cardiomyopathy
- Valvular heart disease
- History of cardiac surgery
- Uncontrolled hypertension
- Abnormal conduction or rhythm disturbance (e.g. Wolf-Parkinson-White syndrome, prolonged QT, etc.)
- Complete right bundle branch block may be compatible with submarine service if an exercise stress test, echocardiography and consultation with a cardiologist are considered normal.
- 1st degree heart block is compatible with submarine service if:
 - A 10 minute exercise challenge indicates that the block is vagal in nature. **OR**
 - An exercise stress test, echocardiography and consultation with a cardiologist are considered normal.

ENT

- Inner ear disease other than presbycusis
- Chronic otitis media / externa
- Perforated tympanic membrane
- In situ tympanostomy tubes
- History of stapedectomy, ossicular chain or inner ear surgery
- Facial nerve paralysis secondary to barotrauma
- Upper airway obstruction
- Laryngectomy or partial laryngectomy
- Uncorrected laryngocele
- History of vestibular decompression sickness

- Meniere's disease
- History of mid-face fractures, or skull fracture with communication between sinuses
- Monomeric tympanoplasty

Neurological

- History of seizure (other than febrile seizures before the age of five)
- Unexplained loss of consciousness
- Significant head injury (e.g. unconsciousness lasting greater than 2 minutes, skull fracture, intra-cranial haemorrhage of any type, post-traumatic amnesia of greater than 30 minutes, focal neurological symptoms, and/or post-concussive symptoms lasting greater than 24 hours)
- Brain lesions or aneurysms
- History of spinal cord injury, disease, or surgery with neurological sequelae
- A history of Type II DCS with permanent neurological deficit or residual symptoms
- History of AGE
- History of transient ischemic attacks or cerebrovascular accident
- Migraine headaches
- Multiple sclerosis or motor neuron disease

Gastrointestinal

- Active peptic ulcer disease
- Altered anatomical relationships secondary to surgery or malformations that can lead to gas trapping
- Significant gastroesophageal reflux or achalasia
- Unrepaired hernias of the abdominal wall
- Crohn's disease/ ulcerative colitis

Endocrine

- Diabetes Mellitus
- Diabetes Insipidus
- Any significant endocrinopathy

Haematological

- Significant anaemia
- Sickle cell trait / disease
- Polycythaemia
- Leukaemia
- Haemophilia
- HIV/AIDs

Mental Health

- Untreated alcohol or drug addiction
- Neurosis, psychosis, or any psychiatric condition which affects judgment
- Major depression
- Bipolar affective disorder
- Claustrophobia or aquaphobia

Other

- Pregnancy
- Drugs incompatible with diving
- Chemotherapy
- Lesions of dysbaric osteonecrosis
- Sequelae of decompression illness
- Chronic low back pain
- Morbid obesity
- Inadequately controlled metabolic syndrome
- Poor exercise capacity
- Significant hay fever or allergic rhinitis
- Chronic viral infections (Hep C, etc.)
- Petroleum sensitivity
- Inadequately controlled psoriasis or eczema

Annex C to CF H Svcs Gp Instruction 4030-71

Medical Advisory Statement for Women in Submarines

Ref: MARC: 3000-0 (D Mar Strat) 28 May 1999 (VICTORIA Class Submarine Interim Concept of Employment Guidance)

1. It is CAF Health Services policy that pregnant members serving in Her Majesty's Fleet are deemed 'unfit sea' and 'unfit alongside' in order to protect the health and safety of the expectant mother and the fetus. This Instruction extends to women serving in submarines. Due to the unique nature of submarine operations at sea, however, there are additional risks of which female submariners need to be informed.
2. The principles of stealth and endurance are fundamental to the nature of submarine operations at sea. As Victoria-class submarines can remain submerged at sea in excess of 30 days, there is the potential for lengthy deployments at sea with limited chance of early disembarkation. In the event of pregnancy, female submariners may be subject to potential complications (e.g. miscarriage, ectopic pregnancy, morning sickness aggravated by

motion sickness) for which definitive medical care may not be immediately available. In addition, they may be exposed to potential environmental hazards that could be dangerous to a developing fetus.

3. Therefore, it is essential that any female member at sea or alongside who may be pregnant is tested as early as possible to confirm pregnancy. Any female member who believes that pregnancy is a possibility should ensure they are tested prior to deployment. Early and simple urine pregnancy tests are available from the submarine’s Physician’s Assistant or from the formation medical facility. CAF members are deemed to be temporarily unfit sea/alongside if found to be pregnant. This remains in effect until the conclusion of the pregnancy.
4. Acknowledged as having read and understood this statement:

(signed by)	(witnessed by)
Date	Date
SN Name Initial Rank	SN Name Initial Rank

Physician’s Assistant,
 HMCS _____

Distribution
 Original – Member / Copy – Member’s medical file

Annex D to CF H Svcs Gp Instruction 4030-71

Medical Screening Guidelines for WPET

Confirm:

- Last Type I or Type II submariner PHA is current. (completed within last 12 months)
- Aircrew and Diver Health Examination form (DND 2452) has been completed and reviewed

in the last 60 days

- A chest x-ray PA (inspiratory/expiratory) and lateral completed and interpreted by a radiologist within the past 5 years.
- Spirometry performed at the last Type I or Type II PHA, and falls within accepted parameters:
 - FEV1 > 80%
 - FVC > 80%
 - FEV1/FVC > 75%
 - FEF 25-75 > 50%

If spirometry does not meet these minimum standards, then full PFTs with flow volumes must be performed, and/or an exercise or methacholine challenge (if clinically indicated).

Spirometry should be repeated if any respiratory symptoms occur between last spirometry and WPET date. Spirometry should be avoided within 48hrs of WPET in order to minimize the theoretical risk of iatrogenic pulmonary micro-barotrauma.

Functional Enquiry:

- Have you done escape training before? When?
- Feeling well?
- Any cough or wheeze in the last week?
- Any pneumonia or other lung disease since your last medical?
- Any sinus or ear problems in the last week?
- Any ENT problems with your flight? (if air transport used for travel)
- Any numbness or tingling anywhere today? Recently?
- Any problems with vision or balance today? Recently?
- Claustrophobic?
- Any allergies (to medications or environmental)?
- Any medications used in the last 48 hrs?
- Any alcohol consumed in the last 24 hrs? Dehydrated?
- Smoker? If “yes”, how many packs per day, for how long?

Physical Exam:

- BP
- HR
- RR
- Ears – TM’s must be visible and there should be evidence of equalization (mobile TM or member can feel a “pop”)
- Sinuses – non-tender
- Chest – no crackles, wheezes or other adventitious sounds
- CVS – no new murmurs or rubs