Transport Canada Transports Canada

SEAFARER MEDICAL EXAMINATIONS

A PHYSICIAN GUIDE

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Canada

Responsible Authority	**Approval**
The Director, Marine Personnel Standards and Pilotage is responsible for this document, including any changes, corrections, or updates.	_____ Director, Marine Personnel Standards and Pilotage Marine Safety

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1. INTRODUCTION

This Guide is intended to standardize the medical examinations of seafarers. It provides the tools and guidelines that Marine Medical Examiners can use while assessing the candidate. It:

- sets out the factors designated Marine Medical Examiners should take into account when conducting medical examinations;
- highlights the physical requirements seafarers need to meet in order to receive a medical certificate;
- includes tests to consider for establishing whether a seafarer meets these requirements; and
- briefly reviews the administrative procedures for the issuance of medical certificates.

Much of this information takes into consideration the International Labour Organization and the International Maritime Organization publication entitled *Guidelines on the Medical Examinations of Seafarers*.

Part 2, Division 8 of the *Marine Personnel Regulations, 2007(MPR)* directs a Marine Medical Examiner to perform medical examinations and advise the Minister of Transport of the seafarers' fitness.

These regulations were made by the Governor in Council under section 100 of the *Canada Shipping Act, 2001* in order to specify the crewing and certification requirements on board vessels. Section 16 of the Act provides for the Minister to specify the manner Medical Certificates are issued and as such, a Marine Medical Examiner may then issue a Provisional Certificate that is valid for 6 months. This gives Transport Canada time to:

- oversee the process and ensure standards are met consistently across the country
- prepare and issue the Ministerial Certificate of fitness, also known as a Canadian Maritime Document, as set out in the *Canada Shipping Act, 2001*.

1.1 SEAFARER ASSESSMENT

Assessing a Seafarer's fitness is not without challenges. So too is the job of a seafarer. Working at sea presents many hazards. Concerns are magnified by the inaccessibility of medical care if the need arises. This is why seafarer's must meet such a high standard of health and fitness.

As an examiner, your assessment will determine if a seafarer can meet the unique safety-critical demands on board ship. You must also determine and/or try to predict if a seafarer's underlying condition could pose an unacceptable risk.

To assist in the seafarer assessment, international organizations cooperated in publishing *Guidelines on the Medical Examinations of Seafarers.* These guidelines were developed to align medical requirements and medical examinations around the world. They are not intended to replace your professional skill and judgment, but to aid in the determination of a seafarers' fitness.

1.2 SEAFARING LIFE AND WORK

The marine environment is unique. This is why you should always consider the following factors during any assessment and before making any final decision about a seafarer's fitness.

The Seafarer

Seafarers must be able to live and work closely with others for weeks and perhaps months. They must be able to cope effectively with isolation from family, friends, culture, and supportive medical care.

As a medical examiner, you should:

- Clearly identify the Seafarer's present role and any intended career plans. This will help you to identify the standard you measure them by and determine any specific limitations.
- Consider the type of vessel, duration of the voyages and destinations of the vessel.
- Identify candidates seeking to start a seafaring career and provide advice about the implications of a medical condition.

Availability and Quality of Medical Care

Ships, especially when on unlimited voyages, operate in areas that are difficult to access. An ill seafarer is difficult to replace. The remaining crewmembers may become overburdened when filling in to perform required tasks. Caring for the ill seafarer puts further strain on crew.

Crewmembers have limited medical background and most vessels carry only basic medical supplies.

There may be limits in transporting the ill to receive definitive medical care.

Since seafarers live in close contact with each other and often, for long periods of time, contagious diseases are a major concern.

It is often impossible to provide or replace required medications.

Work Environment

With the trend to have smaller crews, people have to multitask, especially in emergency situations.

Hours of work may be burdensome and there may be little to no opportunity to take time off.

Workplace ergonomics, hazards and living conditions on vessels are often overlooked, but should be carefully considered. Examples include:

- violent vessel motions
- living and working in cramped spaces
- narrow hatches to pass through

- having to stand for long periods of time
- ladders to climb
- heavy weights to lift
- harsh weather conditions
- excessive heat in machinery spaces
- excessive noise levels
- having to travel by air to access their vessel.

Seafarers must be able to respond to emergency situations and stressful situations that may arise. As in any workplace, violence and harassment may occur on a vessel; however traditional solutions may not apply.

2. CERTIFICATION PROCEDURES

2.1 MARINE MEDICAL EXAMINERS

Transport Canada's Marine Medical Branch issues and revokes appointments. Appointments cannot be transferred to other clinicians. To become a Marine Medical Examiner, a medical practitioner must reside and practice in Canada, and apply for the designation by the Minister of Transport. They should:

- be experienced in occupational medicine.
- have knowledge of living and working conditions on board ships.
- enjoy absolute professional independence from employers, workers and their representatives in exercising their medical judgment.
- be licensed to practice in the province where examinations are conducted.
- provide proof of Registration and a Certificate of Professional Conduct from their provincial College of Physicians and Surgeons.
- attend a Transport Canada Marine Medical Seminar before designation.
- attend the Seminar no less than every four years.

Appointments can be terminated in rare circumstances for the following reasons:

- loss or suspension of medical license.
- low quality of Marine Medical Examination Reports and/or evaluations.
- non-attendance of Marine Medical Seminars at prescribed frequency.

The Marine Medical Branch will maintain a list of all designated examiners and make it available to the public. Examiners should notify the Branch with any:

- change in address,
- prolonged absence, and/or
- inability to provide Marine Medical Exams.

If there is no Marine Medical Examiner within 200 km of where the vessel operates in Canadian waters or the seafarer's place of residence, a non-designated physician or registered nurse may conduct a medical examination if it is within their scope of practice and issue a provisional medical certificate to the seafarer. In such situations, prior to their assessment, the seafarer must notify the Marine Medical Branch, who will then send the appropriate forms and instructions to the examining health professional.

Transport Canada expects a Marine Medical Examiner to be familiar with the certification process, comply with its standards and requirements and conduct a thorough medical examination that properly assesses a seafarer's medical condition and protects public safety. Such an examination will:

- determine not only fitness to safely perform one's duties, but to also deal with emergencies at sea.
- identify conditions or health-related impairments.

- determine the level of risk and danger caused by that medical problem to the candidate, the crew and passengers, the vessel, its cargo and the environment.
- identify conditions that may require emergency treatment.
- determine the critical time needed for treatment/access to appropriate land-based care.

A Marine Medical Examiner shall observe a duty to care and inform the seafarer to pursue any positive finding. However, this does not translate into an obligation to treat except in emergency situations. The seafarer should be referred back to their primary caregiver or specialist for definitive management.

2.2 THE APPLICANT (SEAFARER)

The *Marine Personnel Regulations Part 2, Crewing* outlines those seafarers who must hold a Marine Medical Certificate. Any seafarer who is uncertain should contact their Transport Canada Marine Safety Examination Centre for assistance. Please refer to links in Annex 5.

Any seafarer who is required to hold a Marine Medical Certificate must:

- ensure their Marine Medical Certificate is valid; and
- arrange for a medical assessment with a Marine Medical Examiner when needed.

A Marine Medical Certificate is required for any crewmember of a Canadian Vessel holding a Certificate of Competency **except**:

- **Master Limited for a Vessel of Less Than 60 Gross Tonnage, Non-passenger**
- **Chief Mate, Limited for a Vessel of Less Than 60 Gross Tonnage**
- **Certificate of Service as Master of a Fishing Vessel of Less Than 60 GT**
- **Certificate of Service as Watchkeeping Mate of a Fishing Vessel Less Than 100 GT**
- **Small Vessel Machinery Operator**
- **Small Vessel Machinery Operator, Restricted**
- **Compass Adjuster**
- **Restricted Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boat**
- **Passenger Safety Management**
- **Specialized Passenger Safety Management (Ro-Ro Vessels)**
- **Supervisor of an Oil Transfer Operation**
- **Supervisor of an Oil Transfer Operation in Arctic Waters (North of 60º N)**
- **Supervisor of a Chemical Transfer Operation**
- **Supervisor of a Liquefied Gas Transfer Operation**
- **Fishing Master, Fourth Class**
- **Watchkeeping Mate of a fishing vessel of less than 24 m in length overall**

A Marine Medical Certificate is not required for most members of a crew who are not required to hold a certificate on board a fishing vessel, a vessel on a Sheltered Waters Voyage or Near Coastal Voyage , Class 2 or a vessel less than 200 gross tonnage, unless the vessel is on an international voyage.

2.3 THE ASSESSMENT FORM

Marine Medical Examiners must use the most current edition of the Marine Medical Assessment form. You can order copies by calling 1-888-830-4911 or emailing MPS@tc.gc.ca. You must complete every field in the assessment form and submit the document to Ottawa in a timely fashion.

The form includes a tear-off to give to the seafarer. The tombstone information and Marine Medical Examiner fitness determination are critical as it serves as the Provisional Marine Medical Certificate. While the form is self-explanatory, one field requires clarification.

The Candidate Document Number (CDN) is a unique number that confirms and harmonizes a seafarer's identity information in the Transport Canada Marine Safety (TCMS) database system. You can learn more about the CDN at:

http://www.tc.gc.ca/eng/marinesafety/bulletins-2010-05-eng.htm

The CDN is required by everyone needing a TCMS issued document. Reports submitted to Marine Medicine without a CDN are incomplete and cannot be processed. Seafarers requiring a TCMS Medical Certificate must obtain a CDN **before** their assessment. They can do this by visiting the nearest Transport Canada Marine Safety Examination Centre.

The lower portion of the tear off provides the seafarer information and includes the seafarer's obligations and their appeal rights.

2.4 THE ASSESSMENT

Check the photo identification of any person requesting a marine medical examination before you begin an assessment. Existing Seafarers should provide their existing Marine Medical Certificate so you become aware of any previously determined limitations. It is important that you identify which Certificates of Competency are presently held or intend to be obtained.

Collect as much medical information as possible to substantiate the outcome of the fitness evaluation, especially if you do not know the applicant. Circumstance may require further testing or a supportive letter from the primary caregiver or specialist. In such cases, gather and incorporate this information into the assessment. This is also an opportunity to educate the candidate of the information that will be required for future assessments. Remember to advise the candidate that they must pay any costs related to proving their fitness.

Once you have received all the required information and completed the assessment, there are essentially three courses that you can follow. The candidate may:

1) satisfy all the requirements and can be deemed Fit.
2) require some limitations that allow balancing a health concern with the possible risk it poses.
3) pose too great a risk and will be determined as Unfit.

You can contact the Marine Medical Branch directly at any time to discuss a case and receive advice. But, as a Marine Medical Examiner, you must decide whether or not to

issue a Provisional Medical Certificate declaring the seafarer fit for sea services with or without limitations.

The Marine Medical Branch may subsequently review your assessments. A Marine Medical Certificate, which is a Canadian Maritime Document, will be issued based on the assessment form and the Provisional Certificate. Assessments older than six months from the day of the examination will be considered stale and will not be considered for the purpose of the issuance of a Canadian Maritime Document.

2.5 THE OUTCOME AND PROVISIONAL MEDICAL CERTIFICATE

A Provisional Medical Certificate is valuable because it is equal to a Canadian Maritime Document in meeting regulatory requirements that allow a seafarer to perform a safety-critical role. Seafarers may also use their Provisional Medical Certificates to upgrade their Certificate of Competency.

If a Marine Medical Examiner finds a Seafarer fit, he/she will:

- give the Seafarer a duly completed Provisional Medical Certificate; and
- forward the original Marine Medical Assessment form, any other relevant medical reports and a copy of the Provisional Medical Certificate to the Marine Medical Branch.

If a Marine Medical Examiner finds a Seafarer fit with limitations, he/she will:

- give the Seafarer a duly completed Provisional Medical Certificate that outlines the limitations;
- give the Seafarer a letter addressed to the Seafarer that gives the reasons for the limitation; and
- forward a copy of this letter, along with the original Marine Medical Assessment form, any other relevant medical reports and a copy of the Provisional Medical Certificate to the Marine Medical Branch.

If a Marine Medical Examiner finds a Seafarer unfit, he/she will:

- give the Seafarer a letter addressed to the Seafarer that gives the reasons for not issuing a Provisional Medical Certificate
- forward a copy of this letter, the actual Provisional Medical Certificate that was not issued, along with the original Marine Medical Assessment form and any other relevant medical reports to the Marine Medical Branch.

In all cases, Marine Medical Examiners should keep copies of the Marine Medical Assessment form and any relevant medical reports as outlined by their respective Provincial Medical College.

Note: You will find a sample letter that outlines a Seafarer's limitations or reasons for being Unfit in Annex 1 of this guide.

2.6 VALIDITY PERIODS

Provisional Medical Certificate

A Provisional Medical Certificate is valid for up to 6 months after being issued by the Marine Medical Examiner. The examiner may reduce this time period if circumstances call for it.

A Provisional Medical Certificate becomes invalid when Transport Canada issues a:

- medical certificate by the Minister (Canadian Maritime Document)
- a letter from the Minister declaring his or her refusal to issue a medical certificate.

Marine Medical Certificate

The Marine Medical Certificate is a Canadian Maritime Document issued by the Minister of Transport. This document is valid for a maximum of two years from the date the medical examination is performed except for candidates under 18 years of age, in which case the maximum period of validity is one year.

Marine Medical Certificates that expire during a voyage shall remain in force until the end of the voyage.

A seafarer should be reviewed or assessed by a marine examiner if he or she has:

- been unable to work for 30 or more days because of sickness or injury;
- been evacuated/discharged from ships for health reasons; or
- a significant change in their condition.

Certain circumstances may necessitate more than just a review but a complete Marine Medical Assessment.

The Marine Personnel Standards and Pilotage Directorate of Marine Safety issues Medical Certificates on behalf of the Minister of Transport.

2.7 CONFIDENTIALITY AND DISCLOSURE

The information Transport Canada requires to establish medical fitness to issue a Marine Medical Certificate is collected under Section 16 of the *Canada Shipping Act, 2001*. It is considered to be confidential nature and should be protected.

Section 90 of the *Canada Shipping Act, 2001* outlines the care-givers responsibility to disclose information. If a physician or an optometrist has reasonable grounds to believe that the holder of a certificate has a condition that is likely to constitute a hazard to maritime safety, they should inform the Minister without delay. Sharing such information is not restricted to the time of the Marine Medical Assessment.

Further, the seafarer must inform their caregivers that they are certificate holders and that holding a certificate means they have consented to the Minister being informed of such information.

Note: No legal, disciplinary or other proceedings lie against a physician or optometrist for anything they do in good faith in compliance with this section.

2.8 DUTIES AND RESPONSIBILITIES

The *Canada Shipping Act, 2001* also outlines the responsibilities of others. No master of a Canadian vessel shall operate it unless it is staffed with a crew that is sufficient and competent for the safe operation of the vessel on its intended voyage, and is kept so staffed during the voyage.

Crew members also share responsibility for their safe functioning and shall carry out their duties and functions in a manner that does not jeopardize the safety of the vessel or of any person on board. They are also responsible to report to the master any safety hazards of which they become aware and any change in their circumstances that could affect their ability to carry out their duties and functions safely.

2.9 CONTACT INFORMATION

All calls are welcomed at our Toll Free number: 1-866-577-7702

The Marine Medical Branch's direct Fax number is: 1-613-993-4935

Address:

Transport Canada
Marine Medicine
8th Floor-AMSPM
Place de Ville, Tower C
Ottawa, Ontario
K1A 0N8

2.10 THE CERTIFICATE AND LIMITATIONS

The Marine Medical Certificate is a valuable tool and is recognized internationally. The information it contains is standardized around the world as outlined by the International Convention of Standards, Training, Certification and Watchkeeping for Seafarers.

It provides details and limitations that ensure safety of the seafarer, crewmembers, passengers, the vessel and its cargo and of the environment. These limitations allow for a balance between a health concern and the possible risk it poses. They are broadly classified as: Duty, Geographical, Medical and Time Limitations.

Notes:

- It is very important to include any limitations you assign on the certificate, but **do not** include medical information.

- When a seafarer is convalescing from a condition, you should deem them Unfit. Deeming them fit pending recovery or treatment plan as a limitation is inappropriate.

Watchkeeping

Watchkeeping is a term that refers to the different safety critical roles on a vessel that require unconditional cognitive and perceptual function. Thus, anyone with compromised function may require such a limitation.

Specifically, in Canada's *Marine Personnel Regulations,* "Watch" means

a) In respect of a vessel, crewmembers attending to the navigation, communications, machinery and security of the vessel, and including the master; and

b) In respect of a crewmember, the period during which he or she is required to be on call or physically present.

Duty Limitations:

This category is most relevant to those with any cognitive or perceptual functional deficit.

1) **No Watchkeeping:**
Applies to anyone with a risk of sudden incapacitation. It also reduces the risk for anyone with risk of impaired cognition as a result of a medical condition or medication use.

2) **No Bridge Watchkeeping:**
Applies to those who fulfill the requirements for another department but not necessarily for the bridge.

3) **No Lone Watchkeeping:**
Less restrictive for those with possibly full perceptual functioning, with an ongoing risk of transient cognitive deficiencies such as Hypoglycemia.

4) **Present Occupation Only:**
Some seafarers fulfill the requirements for only their present job. A career change would require a reassessment.

Note: 'Not fit for Emergency Duties' or 'As per Transport Canada' are not valid limitations.

Geographical Limitations:

Registered Canadian Vessels possess an inspection certificate of their own that prescribes it geographical limits. Seafarers must possess a Medical Certificate that allows them to navigate in the regions noted on the vessel's inspection certificate.

Setting geographical limitations are useful for those individuals who are at risk of needing urgent medical attention or who do not necessarily meet International Standards, but can fulfill domestic requirements.

One Nautical Mile represents 1.852 KM and is a unit of length used in sea and air navigation.

These standard limitations are outlined in *The Marine Personnel Regulations* and *The Vessel Certificate Regulations*:

1) **Sheltered Waters Voyage:**
A voyage that is in Canada, on a lake or a river above tidal waters, where a vessel can never be further than one nautical mile from the closest shore.

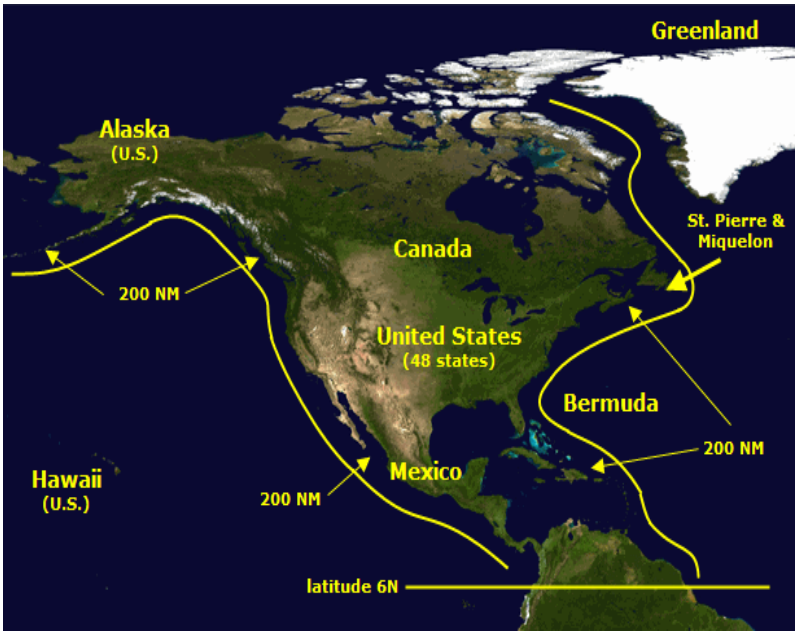
2) **Inland Waters Voyage:**
A voyage on the Inland Waters of Canada together with any part of any lake or river forming part of the inland waters of Canada that lies within the United States or a voyage on Lake Michigan.

3) **Canadian Waters Voyage:**
A voyage that extends to Canadian Territorial waters to 12 Nautical Miles from shore.

4) **Near Coastal Voyage, Class 2:**

A voyage within 25 nautical miles from shore in waters contiguous to Canada, the United States (except Hawaii) or Saint Pierre and Miquelon, and within 100 nautical miles from a place of refuge.

5) **Near Coastal Voyage, Class 1:**



A voyage that is between places in Canada, the United States (except Hawaii), Saint Pierre and Miquelon, the West Indies, Mexico, Central America or the northeast coast of South America.

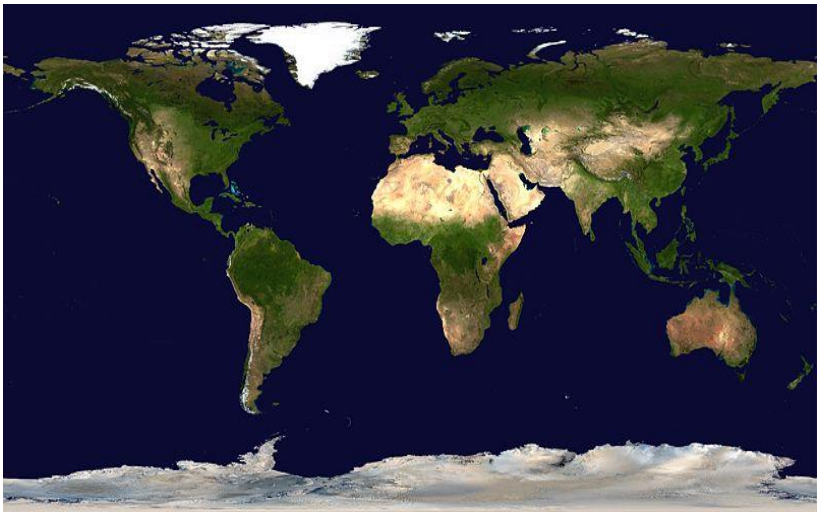
A voyage during which the vessel is always north of latitude 6 degrees north and within 200 nautical miles from shore or above the continental shelf.

This class of voyage extends southward to permit the transit of the Panama Canal and has no limits regarding distances from places of refuge.

6) **Limited Contiguous Waters Voyage:**
A variation of Near Coastal Class 1 limited to the waters contiguous to Canada, the United States (excluding Hawaii) and Saint-Pierre-et-Miquelon.

This limitation applies to those individuals that do not necessarily meet international standards, but can fulfill domestic requirements. Canada and the United States have a Memorandum of Understanding recognizing the other's certificates and thus allow voyages through United States' waters.

7) **Unlimited Voyages:**



No geographical implication

8) **Other Geographical Limitation:**
Nothing prevents a very specific limitation if it is required such as:

Within ___ nautical miles from a shore or port,
Voyage between Point A and Point B only.

Medical Limitations:

Medical limitations reflect the Seafarer's medical needs to ensure they can function safely and address any emergency medical needs.

- Corrective lenses required
- Hearing aids required
- Specialized electrical equipment required while sleeping
- Must carry self-administered medications
- Must avoid specific allergen

Time Limitations:

A provisional medical certificate may have a shorter validity that the six months outlined by the regulations to ensure the seafarer complies with a specific request for information or management by their caregivers.

You may choose to set other time limitations as a way of quantifying the urgency to receive medical attention. It could also be related to a specific medical condition and its functional limitation. These limitations could include:

- The maximal duration of a voyage
- Not to be away from Home Port overnight
- The maximal time away from a specified medical facility

2.11 DIRECTIVES FOR LIMITATIONS OR DYSQUALIFICATION

Listed are some of the possible factors you should consider when making a final decision. They are derived in part from the challenges of seafaring life and work conditions.

The role of most personal physicians is to advocate for the patient. However, the role of a Marine Medical Examiner is very specific and that is to determine the fitness of the seafarer and inform the Minister of any risk to safety.

- Is the known or suspected condition presently stable and what is the probability of an exacerbation or recurrence?
- Could the condition obstruct in the safe performance of regular duties as well as emergency duties?
- Could the disorder prevent the person from speaking in a clear and prompt manner?
- Could there be any personal safety concerns or life-threatening situations?
- Could there be any risk to passengers, crew, vessel, cargo or the environment?
- How quickly could the condition evolve and how quickly would the seafarer require management?
- Could there be an exacerbation of the underlying condition as a result the demands of the job or a work related exposure?
- Are there any medical services on board?
- What would be the impact of lost or damaged medications?
- Does the seafarer have sufficient insight and what is the likelihood they will follow medical advice?

2.12 APPEALS

The *Marine Personnel Regulation* provides 30 days for a seafarer to appeal the outcome of a Medical Examination as indicated on the Provisional Medical Certificate.

A seafarer's employer or prospective employer may also submit a memorandum to the Minister requesting a review of the Provisional Medical Certificate.

Such submissions should be addressed to:

Director, Personnel Standards and Pilotage
Transport Canada (AMSPM)
Marine Medicine Division
330 Sparks Street - Tower C. 8th Floor
Ottawa, ON K1A 0N8

The *Canadian Shipping Act, 2001* provides a review process for:

- a Canadian Maritime Document declaring a Seafarer fit for sea service with limitations
- the Minister's decision to refuse to issue a Canadian Maritime Document.

Such submissions should be addressed to:

Transportation Appeal Tribunal of Canada
333, Laurier Avenue West, Room 1201
Ottawa, ON K1A 0N5
Tel: 613-990-6906
Fax: 613-990-9153
Email: info@tatc.gc.ca

3. REQUIREMENTS

3.1 FUNCTIONAL ABILITIES

Physical and mental abilities have to be assessed. Strenuous working conditions and the potential for rough weather require normal mobility, agility and strength. A seafarer must be able to climb steep stairs, rope ladders and vertical steel rung ladders. They must be capable of working in confined spaces and pass through narrow hatches.

Many of these tasks are more difficult while wearing personal life-saving equipment and breathing apparatus. It is further complicated in emergency situations. Limb amputations, joint instabilities, dysfunction and pain as well as any balance problems or poor spatial awareness, require special assessment.

There are some basic requirements that **all seafarers must meet to be fit**:

a) adequate muscle strength to lift and carry a weight of 22 kg;

b) the physical capacity to wear breathing apparatus and the seafarer's personal life-saving equipment while climbing ladders;

c) the agility and strength to carry out the duties that may be assigned to them regarding fire fighting and vessel abandonment in an emergency;

d) the ability to work in constricted spaces and move through restricted openings of a maximum dimension of 600 mm by 600 mm; and

e) the physical and mental fitness to meet the occupational and operational requirements of the position that they occupy or seek to occupy.

As an examiner, you may use alternative methods to assess the applicant's ability to perform such tasks and document your approach on the Marine Medical report. More specific physical abilities are located in a table in Section 4.5 Obesity. The applicant may use any normally used prosthesis for the evaluation, and have it identified as a requirement on their Certificate. If these universal standards cannot be met, the applicant is **Unfit**.

3.2 VISUAL REQUIREMENTS

Good vision cannot be overstated in any safety-critical role. There are three main categories of visual requirements for seafarers. They are deck, engine, and catering and others, each with different requirements.

However, all seafarers must have at least an unaided vision of 6/60 or 20/200 with both or either eye alone so they can function in emergency situations or at least, be able to evacuate a ship in the absence of one's corrective lenses. Any seafarer unable to meet this standard will be deemed **Unfit**. This is why unaided vision testing needs to be recorded.

All seafarers who meet their specific visual acuity requirement with the use of corrective lenses must have a limitation documented on their Certificate of:

Corrective Lenses required

Deck:

- require 6/12 or 20/40 in each eye
- normal visual fields*
- near vision of N8
- no diplopia, no night blindness, no progressive eye disease

The inability to meet any specific standard will result in a limitation of:

No Watchkeeping

A unique population exists with Marine Pilots. Depth perception has been identified as a requirement to transfer vessels and the Marine Medical Examiner or other practitioner has to ensure the applicant or holder of a Pilotage license or Pilotage certificate, has the depth perception required to perform Pilotage duties.

Engine:

- require 6/15 or 20/50 in each eye
- sufficient visual fields*
- near vision of N8
- no diplopia, no night blindness, no progressive eye disease

The inability to meet any specific standard will result in a limitation of:

No Watchkeeping

The medical standards for vision do not apply to an engineer who held an Engineer Certificate of Competency issued before July 30, 2002.

Engineers meeting this exception will result in a limitation of:

No Bridge Watchkeeping

Catering and Others:

- require 6/60 or 20/200 with both or either eye
- sufficient visual fields*
- near vision sufficient for duties

Monocular Vision

Monocular vision is not a total barrier to safely performing one's duties. Those with newly acquired monocular vision are **Unfit** for 6 months to adjust to the condition.

International requirements of Normal Visual Fields for deck personnel will result in a geographical limitation if the aided better eye can fulfill the acuity standard below. Such a limitation will not be necessary for Engine Personnel who only require sufficient visual fields, but will be restricted to the Engine Department.

- Deck Personnel 6/12 or 20/40 in the better eye
- Engine Personnel 6/15 or 20/50 in the better eye

    - Deck Personnel: **Limited Contiguous Waters Voyage**
    - Engine Personnel: **No Bridge Watchkeeping**

- **All other Personnel: No Watchkeeping**

*Visual Fields – Any significant visual field defect could compromise safety. Medical Examiners who suspect any defect should refer the candidate for further testing.

Notes:

- Typically visual fields in one eye should be no less than 150 contiguous degrees along the horizontal meridian.
- Central or peripheral scotomas must be taken into account when assessing visual fields.
- Scotomas and quadrantanopias will require an ophthalmologic assessment at each evaluation.
- Complete homonymous, bitemporal or binasal hemianopsias would disqualify the applicant.

3.3 COLOUR VISION REQUIREMENTS

All Deck and all Engine personnel need full colour vision. The International Convention for Standards, Training, Certification and Watchkeeping for Seafarers has recently strengthened this requirement. You must carry out colour vision testing at **every** Marine Medical Assessment.

Pseudoisochromatic plate tests differentiate people with normal colour vision and those with defective colour vision that might interfere with safety. **The applicant should not be allowed to wear sunglasses or 'colour corrective' lenses.**

The number of acceptable incorrect responses to each type of plate is shown in the table below. Record the particular set of Pseudoisochromatic Plates and the number of plates you use, as well as the number of errors on the Marine Medical Examination Form.

Types of Pseudoisochromatic Plates			
Type	**Edition**	**Tested**	**Errors Allowed**
American Optical (1965 Ed.)	18	1-18	3
American Optical HRR	20	1-6	0
Ishihara	16	1-8	1
Ishihara	24	1-15	2
Ishihara	38	1-21	3
Ishihara (concise)	14	1-14	Special explanation with plates
Keystone Orthoscope ®		All	0
Keystone Telebinocular ®		All	0
Titmus		All	0

Any candidate who fails a pseudoisochromatic plate test must be further tested with a Farnsworth D-15 Hue Test. Not all Marine Medical Examiners will have the Farnsworth D-15 Hue Test but many optometrists or ophthalmologists can provide such a service.

Make sure to submit the raw data with any report. Since the outcome of this test is valid for **6 Years**, specialised colour vision testing is not required at every Marine Medical Assessment. The seafarer should receive a copy of their report to provide at future Marine Assessments.

Failure of colour vision testing will result in a limitation of:

No Watchkeeping

There are some exceptions:

The medical standards for vision do not apply to an engineer who held an Engineer Certificate of Competency before July 30, 2002.

Also, Division 8, subsection 270. (3) of the *Marine Personnel Regulations*, sets out that the medical standards for colour vision do not apply to a seafarer who:

a) is not required to hold a certificate of competency to perform their duties on board a vessel; or

b) is required to hold one of the following certificates to perform their duties on board a vessel:

(i) Engine-room Rating (ERR),

(ii) Ship's Cook,

(iii) Proficiency in Fast Rescue Boats,

(iv) Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats,

(v) Restricted Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats,

(vi) Oil and Chemical Tanker Familiarization,

(vii) Liquefied Gas Tanker Familiarization,

(viii) Passenger Safety Management,

(ix) Specialized Passenger Safety Management or

(x) Compass Adjuster.

Limitations to impose: **No Bridge Watchkeeping** for Engineers and ERR group (i)

No Watchkeeping for all other groups (ii – x)

3.4 HEARING REQUIREMENTS

Seafarers must demonstrate the ability to recognize all the occupationally related sounds in their specific working environment and effectively communicate. Subjective testing will be continued to be used to screen for hearing and the seafarer must demonstrate the ability to adequately hear conversation. Failing that, an audiogram must be provided. A Marine Medical Examiner with appropriately calibrated equipment or a Registered Audiologist may perform such testing prior to the Marine Medical Exam being finalized.

The audiogram should ensure an average hearing loss of no more than 30dB in the better ear of all seafarers for the frequencies of 500, 1000, 2000 and 3000 Hz.

Those requiring Hearing Aids must undergo a formal Audiology assessment before each Marine Medical Exam. A recent Sound Field Test with Hearing Aids performed with six months **or** a written report from an Audiologist or Ears, Nose and Throat Specialist will be required to confirm that hearing acuity falls within the required objective standards.

Not meeting the auditory standard with or without Hearing Aids will result in a limitation of:

No Watchkeeping

Seafarers who meet the standards with the use of Hearing Aids will require a limitation of:

Hearing Aids required

The medical standards for hearing do not apply to an engineer who held an Engineer Certificate of Competency before July 30, 2002.

Engineers meeting this exception will result in a limitation of:

No Bridge Watchkeeping

4. MEDICAL CONDITIONS

The role of the Marine Medical Examiner is clearly defined to determine the fitness and functional abilities of the individual to perform their duties and deal with emergency situations at sea. It is impossible to provide an all-inclusive list of conditions and certificate outcomes and limitations.

There has to be a common approach and some consensus taking into account the diversity of marine occupations, vessels and voyages, and seafarers. The common thread that binds this all together is safety.

The Minister of Transport requires your opinion of whether a seafarer poses a safety risk to themselves, the crew, the passengers, the vessel and cargo and the environment.

An added benefit to your assessment is that it will contribute to the overall health of the seafaring population.

4.1 CONDITIONS OF ALTERED AWARENESS

Many conditions can cause sudden incapacitation that obviously affect one's ability to function at their post and could put safety at risk.

These conditions can be broken into seven groups:

1) Neurological, e.g., epilepsy or tumours
2) Metabolic, e.g., hypoglycemia
3) Cardiac, e.g., acute coronary syndrome or pathological rhythms
4) Fatigue, e.g., OSA or narcolepsy
5) Respiratory, e.g., chronic lung disease
6) Medication, e.g., opiates, benzodiazepines, mood-altering
7) Other, e.g., vasovagal, traumatic

Examiners must identify the cause of the condition; and the seafarer will most likely have to provide more information or undergo further investigations with their family doctor or specialists.

If the symptom is new with no obvious cause, a seafarer will be **Unfit** for a 3 month period for health professionals to evaluate the probability of recurrence.

If the episodes are recurrent (they have two or more episodes in a 12 month period) the seafarer will be **Unfit** until a diagnosis is made and the condition managed.

If a typical vasovagal syncopal episode is suspected, ask about any provocative features, prodromal symptoms and postural influences. Obviously, no restriction or limitation is required if it has typical features and there is a sufficient prodrome to allow them to manage. However, if it is a recurrent or an atypical vasovagal presentation, a limitation of **No Lone Watchkeeping** should be considered.

4.2 SEIZURE DISORDER

This is a complicated condition with many etiologies that have a common end-effect and impact on function. It may be associated with a variety of cerebral or systemic disorders; however, it is idiopathic in up to 75% of young adults. Approximately 2% of the population will have a seizure during their lifetime. There is a 30% chance of having a recurrence and likely to occur soon after the initial event and then subsequently decline. Seizures that begin after the age of 25 are usually secondary to some form of organic brain disease. Epilepsy has to be distinguished from Syncope or any other cause of loss of consciousness or awareness.

The best predictor of a recurrence is the duration of time since the last seizure. Also, any change or cessation of anti-epileptic medication could affect the chance of recurrence.

You may need to ask the seafarer to provide supportive documents that explains their condition. Determining one to be fit will depend on:

- Whether you believe the seafarer is being truthful about their history,
- If you believe the seafarer is conscientious and will take their medication,
- Whether the seafarer is under regular medical supervision,
- Whether the treatment is working, and
- The treatment doesn't have any significant side effect that would impair their function.

Different limitations are applied to stratify seafarers to avoid placing everyone into the same category and unnecessarily restricting people.

Childhood Febrile Seizure: **Fit**

New or ongoing seizure,
Ongoing investigation,
Within six months of seizure control: **Unfit**

Temporary disqualification is not unreasonable as it provides time to determine the cause of the condition, the impact on function and provide a period of stability.

After six months of being seizure-free with or without medications, the Seafarer may return to work with limitations to mitigate risks.

Seizure-free with or without Rx
for six months: **No Watchkeeping** and **Near Coastal Class I**

After one year of being seizure free, the geographical limitation can be lifted.

Seizure-free with or without Rx
for 12 months: **No Watchkeeping**

If an individual has been seizure free **on or off** medications for a five years, they are deemed fit with no limitations.

Seizure-free with or without Rx
for five years: **Fit**

Special circumstances:

Seafarers who have had fully controlled seizures with medications beyond the 5 year period and change or stop medication must be limited to **No Watchkeeping** for six months and must provide a favourable neurological assessment including a normal EEG. Once confirmed, they may be deemed fit with no limitations.

Those who are seizure free on medications for at least one year and relapse as a result of a physician directed change in treatment may be reinstated with their previous limitation once the treatment has been corrected.

If one suffers a solitary seizure, they are managed as a new onset condition and will be deemed **Temporarily Unfit**. They may be reinstated with a **No Watchkeeping** limitation for one year after a favourable neurological assessment including a normal EEG. After the one year, they will be fit with no limitation.

Alcohol related seizures require a thorough neurological assessment to rule out any other underlying cause and input from an addiction specialist. Case by case decisions are to be based on the severity of the alcohol abuse/dependence. Despite a provocative factor being identified you must impose a 12 month observation period during which they would be **Unfit**. They may be reinstated after their Substance Abuse Professional provides supportive documentation. To return to work, they must observe the two year monitoring program outlined in the Alcohol and Drugs section of this guide.

4.3 SLEEP DISORDERS

Sleep disorders can have a significant impact on normal mental and physical functioning and are often underestimated. There is a broad classification of sleep disorders. The Dyssomnias impact a person's functions and are characterized by either hypersomnulence or insomnia.

Within the Dyssomnias are:

1) Insomnia
2) Obstructive Sleep Apnea
3) Narcolepsy
4) Restless Leg Syndrome
5) Others such as Circadian Rhythm Sleep Disorders.

The other groups that don't have such a serious impact on your assessments are the Parasomnias. There is also a group of secondary conditions that result primarily from psychiatric conditions.

Common to all these is the impact on one's function.

4.3.1 INSOMNIA

This is a very common problem with much aetiology. A recent study revealed up to 58% of adults experienced symptoms of insomnia a few nights a week. This condition is a double-edged sword. On one side, if untreated, it will affect performance and slow reaction time. On the other side, the pharmacological

treatment includes medications with possible side effects that can impact on function. Their use is typically recommended for short term, but patients are often on these medications over the long term.

Ensure the seafarer doesn't have any functional limitations resulting from the condition or its treatment. If there is ongoing use of these medications, issue a **No Watchkeeping** limitation.

If medication use is only periodic, you may deem a seafarer fit without limitations **but** you must make it clear they must not to use the medication within 48 hours of manning their shift. Document your discussion about the prohibition period and side effects.

4.3.2 OBSTRUCTIVE SLEEP APNEA

This condition is becoming much more recognized. One study revealed it may affect nearly 1 in 15 individuals. There are a variety of symptoms that could affect a fitness determination.

There are several ways to screen for Sleep Apnea. The Adjusted Neck Circumference (ANC) is a prediction rule that uses four clinical factors. The ANC is calculated as the sum of the neck circumference and the values for the presence of hypertension (+4), history of frequent snoring (+3), and reported chocking, gasping or witnessed apneas (+2). The calculated value predicts the probability of sleep apnea as follows:

<43	Low Probability
43-48	Intermediate Probability (4-8x as probable)
>48	High Probability (20x as probable)

New England Journal of Medicine, 2002, 347:498-504.

Another easy method of screening would be The Epworth Sleepiness Scale. It has been validated primarily in obstructive sleep apnea as a measure of excessive daytime sleepiness and is repeated after treatment (e.g. CPAP or surgery) to document improvement of symptoms.

The Epworth Sleepiness Scale

How likely are you to doze off or fall asleep in the following situations, in contrast to simply feeling tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the most appropriate number for each situation:

- 0 = no chance of dozing
- 1 = slight chance of dozing
- 2 = moderate chance of dozing
- 3 = high chance of dozing

Situation	Chance Of Dozing
Sitting and reading	
Watching TV	
Sitting inactive in a public place (e.g. a theatre or a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in traffic	

Epworth Sleepiness Scale Interpretation

The score obtained by adding the numbers leads to a total:

0 - 9 average score, normal population

10 - 24 sleep specialist advice recommended

Further testing For Sleep Apnea:

If there is a significant physical finding or a positive screening test, send the seafarer back to their Family Doctor for referral to a sleep specialist or to the Sleep Lab for diagnosis or to titrate their existing CPAP machine as needed if the diagnosis is already apparent. Apply a **No Watchkeeping** limitation until an expert is satisfied there is no longer daytime somnolence.

Once a seafarer is using CPAP and there is evidence of ongoing need, apply a limitation of **Specialized electrical equipment required while sleeping**.

Since Polysomnograms are not readily available in parts of the country, you may screen using overnight oximetry.

A desaturation of greater that **3%** is significant but you may have to weigh it against the symptoms and will possibly require a Specialist assessment.

4.3.2 NARCOLEPSY

This is not a common condition, occurring in only 1 person in 2,000 but it has significant impact on function. It manifests as excessive daytime sleepiness and can cause a person to fall asleep at inappropriate times. There are a variety of treatments available. You will need to request specialist documentation, but you must place a **No Watchkeeping** limit on all seafarers with this condition**.**

4.3.4 RESTLESS LEG SYNDROME

This relatively rare condition will likely require some specialist input. This condition will impact on sleep quality and secondarily on daytime function. A variety of treatments exist and decisions will be based on severity, impact on function, medications used and potential medication side effects. It will require a **No Watchkeeping** limitation.

4.4 DIABETES

This condition is one of our society's biggest health concerns. It may be so widespread in your day-to-day practice that we are desensitized to the potential problems it poses for seafarers with safety critical roles and the inaccessibility to urgent medical care.

Complications can be simplified if viewed as Acute versus Chronic. Acute conditions include:

- **Hypoglycaemia**. Precipitating factors that make this important to consider in seafarers are many and include irregular hours, missed meals, and the physical requirements of the job. Contributing to this is the care-givers insistence for tighter glycemic control. The unpredictability and severity of hypoglycaemia could be a major marine safety hazard.

  There is an obligation to look into this potential problem further. You may want to use the sample questionnaire provided at the end of this guide. (Annex 2)

- **Diabetic Ketoacidosis and Nonketotic Hyperglycemic-Hyperosmolar State or Coma.** These have different etiologies, but similar symptoms. DKA often signals Type 1 DM. However, the Hyperosmolar state results with excessively high blood glucose levels and should be considered with those with poor control. Among many symptoms, one can have impaired consciousness and seizures. If this is the case, you should consider placing limitations on persons with poor control.

The chronic complications of Diabetes are well known and must not be ignored as they could have a significant impact on one's function and longevity. The major system to consider is cardiovascular.

Diabetes Association's Clinical Practice Guidelines provides assistance. You can find it online at:

http://www.diabetes.ca/files/cpg2008/cpg-2008.pdf

It helps identify those at high risk of coronary events. It also gives guidance with screening requirements of these individuals. It is important to consider that most people with the condition will be managed by their Primary Caregivers with evidence-based principles and likely have undergone many of the investigations that would help determine their risk.

Typical Requirements:

- FBS
- AIC
- Lipid Profile
- ACR or Microalbuminuria
- Determination of Hypoglycemic Risk (statement from Family Physician or Glucometer Log)
- Annual Optometrist or Ophthalmologist Report
- Baseline ECG if
  - Greater that 40 yrs old

    - Diabetic for more than 15 years
    - **Diabetic with Hypertension, Peripheral vascular disease or Proteinuria**
- Repeat ECG every two years
- Exercise Stress Test (EST) for men greater that 45 and women greater than 50
- EST for anyone younger who is at high risk
    - Micro or Macrovascular disease
    - Multiple additional risk factors as evaluated by UKPDS or Framingham
    - One extreme risk factor
    - Duration of greater than 15 years if older than 30 yrs old
    - Anyone with typical or atypical cardiac symptoms
    - **Anomalies on resting ECG**

This information will be required at the time of **each** assessment except the EST, which should be based on risk and any changes in the condition. Once you receive the information, you can determine the fitness of the individual and apply any required limitations to reduce the perceived risk.

Newly diagnosed diabetics beginning any form of treatment or any unstable seafarers will be deemed **Temporarily Unfit** until they provide evidence that they are on a stable regimen with no major complications resulting from their diabetes or its treatment.

Individuals with good glycemic control, who have limited cardiovascular risk, are at low risk of having a hypoglycemic event and are undergoing regular monitoring may be **Fit** without any limitations.

If the assessment reveals the potential for significant hypoglycemic event, then the seafarer must address the risk and you must apply limitations. Red Flags would include patients with poor insight of their condition, hypoglycemic unawareness, frequent episodes and those requiring the aid of another individual to correct the condition. In such cases, the following limitations may be required:

- **No Lone Watchkeeping**
- **Requires Regular Meals**

Using Insulin disqualifies the seafarer for any unlimited voyages based on International Standards. As a result, Insulin use requires a limitation of:

- **Limited Contiguous Waters Voyage**

If the assessment uncovers, any significant risk, specifically cardiac, you should direct the person to their treating physician to address the issue.

If the risk remains, depending on that risk, they may be **Unfit** or require more stringent duty or geographical limitations.

You may also choose to impose a time limitation to ensure an appropriate follow-up to reassess the status for any situation.

4.5 OBESITY

Obesity is growing in our society. There are several ways to classify it, with the most familiar being the Body Mass Index (BMI). It has been shown to closely represent one's body fat percentage, but has its obvious limitations.

It is calculated as: **BMI = Weight (Kg) / Height (m)^2**

The most frequently used definition is the one provided by the WHO.

BMI	Classification
< 18.5	Underweight
18.5–24.9	Normal weight
25.0–29.9	Overweight
30.0–34.9	Class I obesity
35.0–39.9	Class II obesity
> 40.0	Class III obesity

However, you can see that Class III may no longer serve in North America and it has been further stratified to:

- Any BMI > 40 is severe obesity
- A BMI of 40.0–49.9 is morbid obesity
- A BMI of >50 is super obese

Waist Circumference is now the focus of interest and is a marker in Metabolic Syndrome (Waist, TG, HDL, BP, FBS). It has a strong correlation with cardiovascular disease. It has a history that dates back to the late 1950's. However, its relationship to insulin resistance wasn't recognized until 1988. There are several definitions of metabolic syndrome but central to all the current ones is the waist circumference. One of the problems with this is the standardization of measurements:

Men: greater than 102 cm
Women: greater than 88 cm

The Workplace Health and Public Safety Program of Health Canada have reviewed the subject and concluded that

"There is no evidence that an obese person cannot medically perform the tasks of most jobs without increased risk to self, colleagues, and the public".

OHAG Advisory/Interpretation 2000-07 Obesity and Occupational Health Medical Assessment

They acknowledge that obesity presents a risk of developing other health problems and there may be performance issues. It is these performance issues that are the focus of your evaluation.

To address this issue and we must rely on functional abilities previously reviewed in Section 3.1. Seafarers are required to meet the following standards:

a) adequate muscle strength to lift and carry a weight of 22 kg;

b) the physical capacity to wear breathing apparatus and the seafarer's personal life-saving equipment while climbing ladders;

c) the agility and strength to carry out the duties that may be assigned to them regarding fire fighting and vessel abandonment in an emergency;

d) the ability to work in constricted spaces and move through restricted openings of a maximum dimension of 600 mm by 600 mm; and

e) the physical and mental fitness to meet the occupational and operational requirements of the position that they occupy or seek to occupy.

If you have ongoing concern with the seafarer's function, if there has been significant interval weight gain, or if the BMI exceeds 35, you could further assess the effects of obesity on the individual's performance by using the following table extracted from The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers. It outlines the minimum physical abilities for seafarers. If the seafarer is unable to pass key components of normal and emergency duties on a vessel, they should be deemed **Unfit.**

Assessment of minimum entry level and in-service physical abilities for seafarers[3]

STCW *Table B-I/9*

Shipboard task, function, event or condition[3]	**Related physical ability**	**A medical examiner should be satisfied that the candidate[4]**
Routine movement around vessel: • on moving deck • between levels • between compartments *Note 1 applies to this row*	Maintain balance and move with agility Climb up and down vertical ladders and stairways Step over coamings (e.g., Load Line Convention requires coamings to be 600 mm high) Open and close watertight doors	Has no disturbance in sense of balance Does not have any impairment or disease that prevents relevant movements and physical activities Is, without assistance[5], able to: • climb vertical ladders and stairways • step over high sills • manipulate door closing systems
Routine tasks on board: • Use of hand tools • Movement of ship's stores • Overhead work • Valve operation • Standing a four-hour watch • Working in confined spaces • Responding to alarms, • warnings and instructions • Verbal communication *Note 1 applies to this row*	Strength, dexterity and stamina to manipulate mechanical devices Lift, pull and carry a load (e.g., 18 kg) Reach upwards, stand, walk and remain alert for an extended period Work in constricted spaces and move through restricted openings (e.g., SOLAS requires minimum openings in cargo spaces and emergency escapes to have the minimum dimensions of **600 mm × 600 mm)** Visually distinguish objects, shapes and signals Hear warnings and instructions Give a clear spoken description	Does not have a defined impairment or diagnosed medical condition that reduces ability to perform routine duties essential to the safe operation of the vessel Has ability to: • work with arms raised • stand and walk for an extended period • enter confined space • fulfil eyesight standards • fulfil hearing standards set by competent authority or take account of international guidelines • hold normal conversation
Emergency duties[6] on board: • Escape • Fire-fighting • Evacuation *Note 2 applies to this row*	Don a lifejacket or immersion suit Escape from smoke-filled spaces Take part in fire-fighting duties, including use of breathing apparatus Take part in vessel evacuation procedures	Does not have a defined impairment or diagnosed medical condition that reduces ability to perform emergency duties essential to the safe operation of the vessel Has ability to: • don lifejacket or immersion suit • crawl • feel for differences in temperature • handle fire-fighting equipment • wear breathing apparatus (where required as part of duties)

NOTES FOR TABLE B-I/9:

1) Rows 1 and 2 of the above table describe (a) ordinary shipboard tasks, functions, events and conditions, (b) the corresponding physical abilities which may be considered necessary for the safety of a seafarer, other crew members and the ship, and (c) high-level criteria for use by medical practitioners assessing medical fitness, bearing in mind the different duties of seafarers and the nature of shipboard work for which they will be employed.

2) Row 3 of the above table describes (a) ordinary shipboard tasks, functions, events and conditions, (b) the corresponding physical abilities which should be considered necessary for the safety of a seafarer, other crew members and the ship, and (c) high-level criteria for use by medical practitioners assessing medical fitness, bearing in mind the different duties of seafarers and the nature of shipboard work for which they will be employed.

3) This table is not intended to address all possible shipboard conditions or potentially disqualifying medical conditions. Parties should specify physical abilities applicable to the category of seafarers (such as "Deck officer" and "Engine rating"). The special circumstances of individuals and for those who have specialized or limited duties should receive due consideration.

4) If in doubt, the medical practitioner should quantify the degree or severity of any relevant impairment by means of objective tests, whenever appropriate tests are available, or by referring the candidate for further assessment.

5) The term "assistance" means the use of another person to accomplish the task.

6) The term "emergency duties" is used to cover all standard emergency response situations such as abandon ship or fire fighting as well as the procedures to be followed by each seafarer to secure personal survival.

4.6 CARDIAC

Cardiac conditions can have a significant impact on one's function and exercise tolerance. That is why you should consider conditions that could require immediate attention when determining fitness. It is impossible to cover every possible cardiac condition and apply standards to each, especially since each person will suffer different degrees of morbidity from their condition. A straightforward approach may be taken so you can offer an opinion on the probability of sudden incapacitation or dysfunction.

Key to a cardiac functional assessment is The New York Heart Classification's four functional categories listed below.

The New York Heart Classification

I No symptoms and no limitation in ordinary physical activity.

II Mild symptoms and slight limitation during ordinary activity. Comfortable at rest.

III Marked limitation in activity due to symptoms, even during less-than-ordinary activity. Comfortable only at rest.

IV Severe limitations. Experiences symptoms even while at rest.

In the past, a stress test was almost always required. The Canadian Cardiovascular Society feels that an assessment and report of the relevant functional class above definitions may sometimes be enough unless one feels it necessary to further determine function or if it was otherwise clinically indicated.

While this may be a reasonable approach for the average patient, a seafaring population is unique with safety critical roles and inaccessibility to medical services. Most cardiac patients already have caregivers and specialists that are using evidence-based investigations and treatment. In such cases, get their opinions.

You can simplify your decision-making process to individual aspects:

Symptoms
Function
Recent Cardiac Events
Risk
Specialist's Opinion
Disqualifiers

Symptoms

Any new symptoms (chest pain, palpitations, presyncope, and shortness of breath) must be investigated. These persons would be deemed **Temporarily Unfit** until evidence is provided. Consider this fitness outcome whenever there is a high index of suspicion.

Function

Regardless of the condition, you must consider function. This is where the NYHC is such a useful tool. Remember, you have to consider not just their baseline function but also their abilities in cases of emergency situations. Anyone in Class III or IV would be **Unfit**.

Recent Cardiac Events

If, for example, a seafarer suffers from an acute coronary syndrome, develops a newly recognized LBBB or undergo a significant cardiac procedure, deem them as **Temporarily Unfit**. Have seafarers get their condition and function assessed by their specialist after a 3 month period. If they get a favourable report from their specialist, you may lift the restriction. You may shorten the waiting period if a specialist supports it.

Risk

Risk is a major consideration. If there is a significant risk for a first time event or the risk of recurrence in people with a cardiac condition, be sure to reflect it the fitness outcome. It may be outside your scope to make such a risk determination and you will often need a specialist's opinion. However, one evidence-based method of determining risk is the Framingham Risk Score. If the risk is considered to be high, there may be little choice but to apply limitations or even deem the seafarer as **Unfit**. Such individuals will require further investigations and management by their treating physicians. If the work-up reveals significant findings, they will need ongoing specialist management and the following limitation should be applied:

- **No Watchkeeping**
- **Sheltered Waters.**

For persons determined to be low risk on that scale, you now have an evidence-based assessment that could substantiate your decision to make them **Fit**.

Specialist Opinion

Seafarers deemed fit with or without limitations may have a specialist recommendation of a specific management plan or frequency for reassessments that you can incorporate into the limitations such as **'Voyages not to exceed 30 days'**.

Disqualifiers

Some conditions bring an unacceptable risk. Seafarers with the conditions below will be deemed **Unfit.**

- NYHC Class III or IV
- Implanted Cardioverting Defibrillators (ICD) unless used for prophylactic reasons based on positive genetic screening in a low risk patient and the cardiologist feels there is <1% risk of sudden incapacity. In this unique population, **No Lone Watchkeeping** and **LCWV** restrictions are required.
- Cardiac Transplant
- Acute Pericarditis, Myocarditis, or Bacterial Endocarditis (risk of embolism) until fully recovered

- Angiographic demonstration of >50% reduction in diameter of LCA
- Mobitz II Second and Third Degree heart blocks
- VT of either hemodynamically unstable or LVEF < 35%
- Symptomatic Sick Sinus Syndrome until successfully treated
- Symptomatic SVT, Atrial Fibrillation, Atrial Flutter until after 3 month period of stability after treatment
- Within One Month of implantation of Permanent Pacemaker and cardiology review of function
- Congested Heart Failure with Ejection Fraction < 35%

4.7 HYPERTENSION

Hypertension is primarily considered as a long-term risk factor however; there are some acute situations that you must consider. It can impact multiple systems, primarily, the CNS and CVS. While there are different cut-off values and management approaches, anyone with a blood pressure of >170/100 is **Unfit**.

4.8 ANTICOAGULANTS

An aging population brings more people with Atrial Fibrillation, valvular disease and other thrombotic disorders. When we consider the typical patient, we usually realize the risks involved in the use of an anticoagulant, but it is almost always outweighed by the benefits (60% reduction of Non-valvular Atrial Fibrillation Strokes for example).

This is not true, however, with Seafarers, where the typical risk/benefit analysis is skewed. Theirs is physical work which poses an increased risk to injury. The potential movements on board a vessel and the risks of falling compound this risk of injury. There is also the inaccessibility of care while at sea that leads to obvious difficulties of dealing with poorly controlled bleeding as well as the impact of interfering with monitoring protocols.

The risk of major bleeding while on an anticoagulant has recently been revised and surpasses 3% annually. *New England Journal of Medicine*, 2010, 363:1875-76. However, this doesn't necessarily apply to seafarers. And even if such a risk would be acceptable, practical issues of bleeding have to be considered.

Health Canada recently provided a guideline for Warfarin use and Safety Sensitive Work. They conclude that for the use of Warfarin may not be an automatic disqualification.

OHAG Bulletin 2008-01 – Warfarin use and Safety Sensitive Work

In the past, the focus was dedicated to Warfarin, but there are other agents available, Clopidogrel and Dabigatran to name some. They may have different monitoring needs, but the basic issues of trauma and bleeds are the same.

With this in mind, there are some specific issues that are specific to seafarers:

1) Consider the underlying condition for which they are being treated and ensure no functional limitations as well as no risk of incapacitating recurrence, essentially that reviewed with the Cardiac Conditions. For example, Atrial Fibrillation that is not well rate-controlled and other arrhythmias, a Cardiology consult may be needed.

2) No ongoing DVT or PE. Once DVT resolved for 1 month and PE resolved for 3 months, reconsideration.

3) For all seafarers using Warfarin, reassurance of INR stability for 3-month period and planned regular monitoring (monthly).

4) Further determination will depend on the perceived risk of injury. Factors that will play into this would include:

    - Seafarer age
    - Size of vessel. A larger vessel will have relatively less movement and risks of falls.
    - **Availability of portable INR instruments.**

Any seafarer using anticoagulants may not go beyond **Near Coastal Class II**.

4.9 PRESCRIPTION OPIATES

Significant advances have been made in the management of Acute and Chronic Pain with the introduction of new and different agents. Side effect profiles have also improved. However, you must consider a variety of factors. Many seafarers are in safety critical roles which vary dramatically in emergency situations. It is nearly impossible to extrapolate the potential influences of any of these agents on the function of these individuals. Even if one has been on a particular product for any length of time, they may be called upon to function in an emergency and there may be no room for error. This is why a firm and strict policy is in place:

- **Opiates are prohibited in a Marine Environment**
- **Any periodic use is not permitted within 48 hours of sailing.**

This applies to every member of the crew. People who cannot function without the regular use of these medications may have to reconsider their career options.

There will be some who use opiates occasionally. They must understand that use is not permitted within 48 hours of sailing. If there are any concerns regarding their use of opiates, ask them to provide supporting information from their treating physician or specialist to confirm:

- the underlying condition and any functional limitation it imposes
- the different treatments and outcomes
- the use of relatively low doses of opiates
- the stability of the dose
- no adverse side effects of the medications
- any impact on the patient's behaviour and function
- evidence of no signs of abuse of opiates, and
- no aberrant behaviour or other substance abuse

While you don't have to apply a limitation to such a person's certificate, you must make sure they understand use is not permitted within 48 hours of sailing. Document this warning, and the fact you explained it to the seafarer, on his or her medical report.

There will be requests for the use of Tramadol. It is a useful agent and has a different side effect profile compared to other analgesics. It has the potential of causing seizures, especially with concomitant use of other medication. There is also the potential to cause psychological and physical dependence. For these reasons, it will be restricted in the same way as other opiates.

Methadone use is becoming more prevalent and its purpose is clear in treatment programs, but it, like other opiates, is also prohibited. However, upon receiving a supportive letter from their caregiver outlining the cessation of this medication and the status of the underlying condition, the seafarer will be allowed to resume duties but possibly with limitation. Similar reports may be requested periodically at an interval of every 3 months for up to two years based on the circumstances at the prerogative of Transport Canada's Marine Medical Branch.

4.10 PSYCHIATRY

There are many challenges in assessing seafarers' mental fitness, which include the:

- variety of psychiatric conditions that exist,
- diversity of presentations,
- potentially rapid fluctuations in severity and,
- lack of firm statistical data about the effects of these disorders on one's function

The prevalence of these conditions is rising and is more often reported due to our society's more open approach to them.

Within our seagoing population, factors contributing to a greater concern and susceptibility of such conditions include but not limited to the:

- potential duration away from home,
- lack of support,
- working with authoritive people,
- cramped living quarters,
- different racial, social, religious groups of coworkers,
- irregular hours and sleep,
- dangerous working conditions,
- expectations to function in emergency situations,
- difficulty for ongoing psychological treatment and support,
- unavailability of replacing medication.

A balanced approach is necessary to allow competent individuals work without compromising safety.

Mental fitness is crucial as it can have a significant impact on cognition, thought processes, judgement, reaction time, motor function, and perceptual changes. Individuals may become aggressive, erratic, reckless, and feel invulnerable; to name a few.

Always consider medication use, side effects and the consequences of a missed dose that could hamper a seafarer with their safety-critical jobs.

With most medical conditions, supporting documents are essential. This is especially true for mental health, since it is unrealistic to be able to assess any significant mental health issue at only one brief visit, which also includes the individual's entire health review and physical exam. The seafarer's Family Physician, Psychiatrist, or Substance Abuse Professional is a valuable partner that can provide critical information on the seafarer's condition and status.

However, keep in mind that many of these providers are frequently advocating for the patient and may not recognize their patient's safety-critical role, the inaccessibility of medical support and services, and the challenges of the job.

This is why, despite supporting documents being a critical part of the assessment, you must carefully consider:

- Function
- Risk of recurrence
- Risk of a mild condition worsening
- Co-morbidities
- Ability to function in an Emergency Situation
- Side effect of medications
- The patient's insight, responsibility and compliance with management
- Overall risk to safety.

For most patients, the history they provide may reveal significant information, especially if they have good insight into their condition. After careful consideration, if it is only a mild depression or an anxiety disorder, you may determine there is no significant impairment and deem the seafarer **Fit**.

For more significant conditions or if an issue arises from your questioning, the obligation would be to seek more information. Once you receive an outside opinion, the seafarer will have to be reassessed and the fitness assessment concluded.

If you determine that the psychiatric condition has a low risk you should be comfortable to assess them as **Fit** with No Limitations especially if they have good insight, comply with treatment, are free from any side effects of medications and have good medical follow-up. This decision must be substantiated.

If, there is evidence of a significant risk of recurrence or a severe impairment, or possibly significant side effects, then the seafarer would have to be deemed **Unfit**. You may invite them to undertake management and request them to provide supportive documentation and return for a reassessment.

Alternatively, if there is a focal dysfunction, perhaps in cognition resulting from medications, returning to work with a limitation of **No Watchkeeping** would be appropriate. Consider issuing a time limitation to monitor any changes in the condition.

Specific Conditions:

4.10.1 SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER

Common to both are changes in perception, thinking, emotion, and interpretation of events leading to erratic, bizarre and unpredictable behaviour and

relationships. The environment on board ship with the cramped quarters, intense relationships with a limited number of people, inability to have time alone, constant noise, separation from family and so on is very difficult for such individuals.

Even a stable patient on medication may be destabilized in such an environment. One may have longstanding mild symptoms but may have unpredictable changes in behaviour and as such, even brief voyages would be dangerous.

This is why any seafarer suffering one of these conditions is **Unfit**.

4.10.2 DELUSIONAL DISORDER

While similar to the above, the delusions lack the bizarre quality seen with Schizophrenia. Also, symptoms of a major mood disorder are absent and there is a variable, but typically no severe impact on psychosocial functioning. However, a risk still remains as one can develop unpredictable and bizarre behaviour based on the delusions or changes in delusions.

There is a spectrum here and it depends on the nature of the delusion. Delusions about specific events distant in time or space such as the knowledge of the true murderer of a celebrity or having been abducted by a flying saucer 10 years ago, and that have not been acted upon for several years would be categorized differently from delusions involving jealousy, persecution, grandiosity or somatic symptoms as well as delusions being acted upon.

As a result of this spectrum, there will be some stratification of outcomes. The majority will be **Unfit**. However, you may decide to deem Fit with Limitations of **No Watchkeeping Duties,** seafarers with supportive documentation from their psychiatrist and evidence of:

- No previous effect on function
- No previous aggression
- Delusions stable
- Delusions not being acted upon
- Delusions irrelevant to life at sea; or
- Good insight, compliance and ongoing follow-up

While unusual, you may decide to issue a certificate that deems a seafarer **Fit** with no limitations if he or she is deemed in complete remission is **and/or** has:

- Lack of delusions for 2 years
- Complete insight
- Delusion seen as unimportant by the patient i.e. 'true, but I don't care now'
- AND no previous effects on function
- AND no previous aggression may be considered.

4.10.3 BRIEF PSYCHOTIC DISORDER

The key feature is a sudden onset of psychosis, typically florid, that lasts no longer than one month and the individual has a full return to their premorbid functioning. It may be with or without a precipitating psychosocial stressor.

During the disorder, the seafarer is **Unfit**.

In the setting of a precipitating stressor and after three months have passed since a complete resolution of the disorder, the seafarer can return to work as **Fit** with no limitations.

In the absence of a precipitating stressor and after six months have passed since a complete resolution of the disorder, the seafarer can return to work as Fit with Limitations of **No Watchkeeping**. After 2 years have passed, the seafarer may be considered **Fit** with no limitations.

Any recurrence of psychotic symptoms necessitates that the seafarer is **Unfit**.

4.10.4 BIPOLAR I DISORDER

The essential feature of this condition is the occurrence of one or more Manic Episodes. Further, this disorder (as opposed to Type 2) must have:

- produced "marked impairment" in occupational functioning, social activities or relationships; or
- required hospitalization; or
- presented with psychotic features.

The same risks posed by schizophrenia exist with this disorder. Individuals suffering a Manic episode exhibit poor judgement and frequently do not recognize that they are ill. Some, especially those with psychotic features, may become violent or suicidal (completed suicide in 10-15% of bipolar type 1). Many will also have associated Alcohol and other Substance Use Disorders. Ninety per cent of persons who have a single manic episode have a recurrence. Some (20-30%) continue to exhibit residual symptoms and many (60%) experience interpersonal and occupational difficulties between episodes. The interval between acute episodes tends to decrease with age.

As a result, a seafarer diagnosed with Bipolar Disorder Type 1, is **Unfit**.

4.10.5 BIPOLAR II DISORDER

This disorder is distinguished from Type 1 by the fact that it has **not been severe enough** to:

- cause "marked impairment" in occupational functioning or social activities
- require hospitalization
- include psychotic features.

A seafarer is **Unfit** during any stage that this condition is being investigated and/or treated. By definition, this condition is typically not severe (only

Hypomanic), but if it is frequent or if the episodes, which while not psychotic, cause significant problems at sea or on land, you must deem the seafarer **Unfit**.

Otherwise, once in remission and the seafarer is complying with treatment, has good insight and has good function, you may consider them Fit with Limitations of **No Watchkeeping**.

After two years have passed without recurrence and off medications, you may consider the seafarer **Fit** with no limitations.

4.10.6 DEPRESSION, DYSTHYMIA, ANXIETY DISORDERS

These conditions present a wide range of severity of symptoms. The risks to safety include reduced performance, slow response, indecisiveness, difficultly in dealing with emergencies, interpersonal turmoil, and suicidality. The determination of fitness will depend on the degree of the symptoms and their influence on function.

Severe symptoms, significant impairment, poor compliance, poor insight, or a risk of exacerbation at sea will require the Seafarer to be deemed **Unfit**.

People with less severe symptoms may be considered Fit with Limitations of **No Watchkeeping Duties**. Once the condition has resolved, the seafarer may be considered **Fit** with no limitations.

4.10.7 ATTENTION DEFICIT DISORDER

Many people with adult ADD can function without medication, but function better with it. Psychostimulants are the first line medication for this condition so when making an assessment takes into account the fact that these medications can be abused or sold.

If there is a way to secure the medication and the seafarer is reliable and has good insight and good function, you may consider him or her **Fit** with no limitations.

4.10.8 DELIRIUM, DEMENTIA, AND AMNESTIC AND OTHER COGNITIVE DISORDERS

Previously known as Organic Mental Syndromes and Disorders, the key feature for this group of conditions is a clinically significant change in cognitive function. You must deem seafarers with these conditions **Unfit.**

With the exception of Delirium, once the acute condition is resolved and it is unlikely to recur and there are no sequellae, you may consider the seafarer **Fit** with no limitations.

4.10.9 MEDICATIONS

Taking medications is not in itself enough to cause unfitness, but obviously, it is an important factor you **MUST CONSIDER IN ALL CASES**. There are too many variations to make absolute rules. In mild conditions, most medications are

helpful, but not necessary. In the absence of any side effects, no limitation will be required.

However, other conditions require medications and you should advise the seafarer to continue their treatment. This is also true of medications that have the potential of a discontinuation syndrome.

Regardless of the condition or the specific medication used or whether used intermittently, you should question the seafarer about side effects and document the response. Any evidence or concern about side effects that will affect the seafarer's function will require a **No Watchkeeping** limitation.

The seafarer should be informed that using Benzodiazepines and any sedatives is prohibited within 48 hours of sailing.

4.10.10 ALCOHOL AND SUBSTANCE ABUSE

Consider this during all assessments. It is addressed in the next section, but it is often a component of mental disorders and requires special attention when you assess one's mental health.

4.11 ALCOHOL AND DRUGS

The Canadian Counsel of Motor Vehicle Administrators state that "Despite alcohol's social acceptance, it is simply another sedating drug that interferes with judgement, reflex control and behaviour."

Alcohol consumption is accepted and so prevalent in our society that it easy to become desensitized to it. Since seafarers hold safety sensitive positions in which there is a lot at stake, you must give this issue special attention.

The problem starts with what constitutes too much alcohol and what is acceptable? Further, can you the examiner, turn a blind's eye to any excessive quantity being declared as consumed only off duties? These are challenging questions but help is available with Canada's Low-Risk Alcohol Drinking Guidelines developed by the National Alcohol Strategy Advisory Committee. These guidelines were developed to reduce immediate and long-term alcohol consequences. You will need to use your clinical judgment when assessing acceptable limits of consumption. However a consumption of > 15 standard alcohol units per week for men and > 10 for women would grounds for further evaluation. More information can be found at the Canadian Center on Substance Abuse at:

http://www.ccsa.ca/Eng/Priorities/Alcohol/Canada-Low-Risk-Alcohol-Drinking-Guidelines/Pages/default.aspx

Many question how effective objective markers are to screen and what these markers really tell about a person's function and risks. Following are some references pointing to the advantages of questionnaires.

A 2005 study confirmed that an elevated GGT, MCV and carbohydrate-deficient transferrin (%CDT) could be a predictive screen up 90% of the time. However, the authors suggested it was too early to use any biochemical markers for screening. *Addiction.* 2005; 100(10): 1477–1486

Another study from Helsinki provided a predictive value of only 54% and deemed objective testing as not being a useful screening tool. They further determined GGT alone detected only a third of patients having more than 16 "drinks" per day. In contrast, the brief questionnaires and interviews identified nine out of ten alcoholics. *Lancet* 1982 Feb 6;1(8267):325-8.

There are a variety of screening questionnaires. There is the Michigan Alcohol Screening Test (MAST) and it is a screening tool for alcoholism widely used by courts.

The CAGE questionnaire has a sensitivity of 93% and a specificity of 76% for the identification of problem drinking. *Lancet* 1982 Feb 6;1(8267):325-8

The **CAGE questionnaire** involves 4 questions:

1) Have you ever felt you should ***cut*** down on your drinking?
2) Have people ***annoyed*** you by criticizing your drinking?
3) Have you ever felt bad or ***guilty*** about your drinking?
4) Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (***eye-opener***)?

Total scores of 2 or above are thought to be clinically significant and may indicate alcohol dependence. *JAMA* 1984, 252: 1905-1907.

An example of its use is a Canadian study trying to identify how big of a problem alcohol use is in Canada. It identified almost 6% of Canadians with positive results. They were able to correlate a 7 times greater risk of alcohol related problems with this positive group. Unfortunately, the majority (85%) were not indentified or seeking help for the issue. *Can Med Assoc J*. Dec 1, 1997; 157 (11) 1529

A recent systematic review of the literature has concluded that the AUDIT is the best screening instrument for the whole range of alcohol problems. The World Health Organization developed it and it has been validated in six countries. It helps to identify persons with hazardous and harmful patterns of alcohol consumption. It has been found to provide an accurate measure of risk across gender, age, and cultures.

There are a couple of definitions that are implemented in this screening test.

Hazardous drinking is a pattern of alcohol consumption that increases the risk of harmful consequences for the user or others. Hazardous drinking patterns are of public health significance despite the absence of any current disorder in the individual user.

Harmful use refers to alcohol consumption that results in consequences to physical and mental health.

Alcohol dependence is a cluster of behavioral, cognitive, and physiological phenomena that may develop after repeated alcohol usage which includes a strong desire to consume alcohol, impaired control over its use, persistent drinking despite harmful consequences, increased alcohol tolerance, and a physical withdrawal reaction when alcohol use is discontinued.

You will find the entire document at:
http://whqlibdoc.who.int/hq/2001/who_msd_msb_01.6a.pdf

AUDIT consists of 10 questions about recent alcohol use, alcohol dependence symptoms, and alcohol-related problems.

Box 4

The Alcohol Use Disorders Identification Test: Interview Version

Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.

1. How often do you have a drink containing alcohol?
   (0) Never [Skip to Qs 9-10]
   (1) Monthly or less
   (2) 2 to 4 times a month
   (3) 2 to 3 times a week
   (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?
   (0) 1 or 2
   (1) 3 or 4
   (2) 5 or 6
   (3) 7, 8, or 9
   (4) 10 or more

3. How often do you have six or more drinks on one occasion?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily
   Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?
   (0) Never
   (1) Less than monthly
   (2) Monthly
   (3) Weekly
   (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?
   (0) No
   (2) Yes, but not in the last year
   (4) Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?
    (0) No
    (2) Yes, but not in the last year
    (4) Yes, during the last year

Record total of specific items here

If total is greater than recommended cut-off, consult User's Manual.

There are two ways to interpret the results:

1. the total score reflects the patient's level of risk related to alcohol; and
2. individual responses differentiate different zones or risk levels and prescribes different actions.

Scores of 8 or more indicates hazardous and harmful use. If you use a cut off of 10, it will provide you with greater specificity and give you fewer false positives. For individuals older than 65 years old, you may consider a cut off of 7.

Box 6

Risk Level	Intervention	AUDIT score*
Zone I	Alcohol Education	0-7
Zone II	Simple Advice	8-15
Zone III	Simple Advice plus Brief Counseling and Continued Monitoring	16-19
Zone IV	Referral to Specialist for Diagnostic Evaluation and Treatment	20-40

*The AUDIT cut-off score may vary slightly depending on the country's drinking patterns, the alcohol content of standard drinks, and the nature of the screening program. Clinical judgment should be exercised in cases where the patient's score is not consistent with other evidence, or if the patient has a prior history of alcohol dependence. It may also be instructive to review the patient's responses to individual questions dealing with dependence symptoms (Questions 4, 5 and 6) and alcohol-related problems (Questions 9 and 10). Provide the next highest level of intervention to patients who score 2 or more on Questions 4, 5 and 6, or 4 on Questions 9 or 10.

Further, the questions are clustered into domains and could differentiate different issues.

Significant scores

- Points in Q#2 or Q#3 Consumption at Hazardous levels
- Points in Q#4 to 6 Presence or incipience of dependence
- Points in remainder Indicate harm is already being experienced

Also, the last two questions 9 and 10, gives insight as to whether there is evidence of a past problem and may suggest vigilance of the patient.

Box 2

Domains and Item Content of the AUDIT

Domains	Question Number	Item Content
Hazardous Alcohol Use	1	Frequency of drinking
	2	Typical quantity
	3	Frequency of heavy drinking
Dependence Symptoms	4	Impaired control over drinking
	5	Increased salience of drinking
	6	Morning drinking
Harmful Alcohol Use	7	Guilt after drinking
	8	Blackouts
	9	Alcohol-related injuries
	10	Others concerned about drinking

WHAT ABOUT DRUGS?

Once again, rely on Screening Questionnaires. One useful tool is called the Drug Abuse Screening Test or DAST-20 that originated from the Addiction Research Foundation in Toronto.

It is a 20-item instrument that may be given in either a self-report or in a structured interview format with a "yes" or "no". It is a brief, simple, practical, and valid method for identifying individuals who are abusing psychoactive drugs. It yields a quantitative index score of the degree of problems related to drug use and misuse. DAST scores are highly diagnostic with respect to a DSM diagnosis of psychoactive drug dependence.

The questions concern information about potential involvement with drugs not including alcoholic beverages during the past 12 months.

It screens for the use of prescribed or over the counter drugs in excess of the directions and any non-medical use of drugs. The various classes of drugs may include: cannabis, solvents, tranquilizers, barbiturates, cocaine, stimulants, hallucinogens or narcotics.

A DAST score of six is typically significant. It is also suggested that a score of 16 or greater be considered to indicate a very severe abuse or a dependency condition. The DAST also provides a score that should be sensitive to changes in substance using experiences over a 6 and 12-months follow-up period, as suggested by the author.

DAST-20

Have you used drugs other than those required for medical reasons?

Have you abused prescription drugs?

Do you abuse more than one drug at a time?

Can you get through the week without using drugs?
(Inverse response scored)

Are you always able to stop using drugs when you want to?
(Inverse response scored)

Have you had "blackouts" or "flashbacks" as a result of drug use?

Do you ever feel bad or guilty about your drug use?

Does your spouse (or parents) ever complain about your involvement with drugs?

Has drug abuse created problems between you and your spouse or your parents?

Have you lost friends because of your use of drugs?

Have you neglected your family because of your use of drugs?

Have you been in trouble at work because of drug abuse?

Have you lost a job because of drug abuse?

Have you gotten into fights when under the influence of drugs?

Have you engaged in illegal activities in order to obtain drugs?

Have you been arrested for possession of illegal drugs?

Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?

Have you had medical problems as a result of your drug use (e.g. memory loss, hepatitis, convulsions, bleeding, etc.)?

Have you gone to anyone for help for a drug problem?

Have you been involved in a treatment program specifically related to drug use?

DAST INTERPRETATION GUIDE

RISK	DAST-20	ACTION
None	0	Monitor
Low	1-5	Brief Counselling
Intermediate (meets DSM Criteria)	6-10	Outpatient (intensive)
Substantial	11-15	Intensive
Severe	16-20	Intensive

Regardless of whether it is alcohol or drugs, there is NO tolerance to allow anyone at risk to be allowed to hold a safety critical post. It is important to constantly remain vigilant as individuals are not likely to provide such information readily.

Administer a screening test to, or send to their treating physician, any seafarer that;

- declares excessive use,
- presents behavioral cues,
- has received a Driving Under the Influence charge, and/or
- presents any alcohol or drug-related physical stigmata.

If the screen suggests problems, you should advise the seafarer of your concern and have them see their family doctor or a Substance Abuse Professional (SAP) to address the issue further and look at their treatment options.

If there is any evidence of a significant issue, you must deem the seafarer **Unfit**.

There are many opportunities for a rehabilitation program and ongoing monitoring of the alcohol or drug use behavior. Remember, Methadone Programs are not permissible.

Those diagnosed with a substance abuse disorder may be reinstated if they produce a supportive letter from a SAP when at least 3 months has passed since completing a Rehabilitation Program. You may choose to apply limitations.

You would you base your decision on answers to the questions below.

1) Are there any cognitive deficits?
2) Have there been any withdrawal seizures?
3) Are there any motor deficits?
4) Any maladaptive behaviors?
5) Any co-morbidity such as mental health or liver disease?

It would also depend on documentation from the SAP or family doctor.

1) Are they supportive of a return to duties?
2) Are objective markers such as LFTs responding?
3) Is monitoring ongoing and reflecting abstinence?

4) Was the treatment program completed and participation in post-treatment activities?

If a seafarer meets these criteria, grant him or her a time limited Certificate of 3 months during which time, their caregiver provides supportive documentation and objective blood or urine screens. This frequency of evaluation every 3 months will continue for a period of TWO years and monitoring of such will occur at the Marine Medical Unit.

If there are any doubts, impose a limitation of **No Watchkeeping**.

Those that are recently diagnosed and elect to not undergo rehab will remain **Unfit**. Upon re-applying, they must see a SAP and probably undergo the same 3month-monitoring program for 2 years dependent on the SAP assessment.

Those with a past history of Substance Abuse **and** dependent on the Marine Medical Examiner assessment **may** require documentation from their SAP or Family Doctor reflecting abstinence for at least 2 years.

4.12 ASTHMA

Asthma is a chronic respiratory condition that affects 7% of the population. It is more common in childhood, with a prevalence of up to 15%. Many 'outgrow' their symptoms, but may have some residual hyper-reactivity and symptoms may resurface with the right conditions. Occupational asthma is the most commonly reported occupational respiratory disease. The American Thoracic Society identifies up to 23% of new-onset adult asthma as work related. Asthma requires attention as this condition could be life threatening.

Classifying asthma is straightforward.

1) **Intermittent** - mild symptoms less than once weekly and easily responds to beta agonist. FEV1 > 80% predicted
2) **Mild Persistent** - mild symptoms more often that once weekly. Periodic use of inhaled steroids and still responds to beta agonist. FEV1 > 80% predicted
3) **Moderate Persistent** - symptomatic, daily and nightly. Regular use of inhaled steroids and occasional use of oral steroids. FEV1 60-80% predicted
4) **Severe Persistent** - symptomatic day and night. Frequent use of Oral steroids. Frequent hospitalizations. FEV1 < 60% predicted.
5) **Exercise Induced** - episodes provoked by exertion especially in the cold. Responds to beta agonist.

Your focus is on the condition's relationship to fitness to work at sea. Regardless of their severity, make sure they can wear their emergency breathing apparatus.

You must consider the possibility of an acute exacerbation that could lead to a severe or life-threatening situation. You can do this by assessing:

- any specific triggers and how to avoid them;
- the severity of their condition and possible previous oral steroid use and hospitalizations; and
- how successfully they respond to their treatment?

The approach to assessing a seafarer's fitness to join the ship's complement is as follows:

Anyone who is Intermittent or Mild Persistent and your assessment is supportive, you may well deem **Fit**.

Those who are Moderate Persistent will require input from a specialist, but they will likely be **Fit with Limitations**. It will likely be Geographical, limiting them to Inland or Sheltered Waters. Near Coastal Class I or Near Coastal Class II could only be considered if supported by the specialist.

Seafarers with Exercise Induced may require input from a specialist and their severity would determine whether they are **Fit** or alternatively, **Unfit** keeping in mind there is no limitation preventing one from emergency duties and exertion.

You must deem those with Severe Persistent asthma **Unfit**.

You should consider placing Medical limitations such as: **Must carry self administered medications** on all seafarers with asthma**.**

4.13 CHRONIC OBSTRUCTIVE PULMONARY DISEASE

This condition, if severe enough, can be disabling. There are many facets to this group of respiratory conditions that you can evaluate, but your focus is function. There are several ways to do this, but one way to do so would be to quantify breathlessness.

A validated tool to assess this is the MRC Breathlessness Scale. It assigns one of five grades that relate breathlessness that could apply for any respiratory condition to activities and function.

Grade	Degree of breathlessness related to activities
1	Not troubled by breathlessness except on strenuous exercise
2	Short of breath when hurrying or walking up a slight hill
3	Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace
4	Stops for breath after walking about 100m or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing or undressing

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Any supplementary oxygen use and MRC Grades 4 and 5 would **Disqualify** the seafarer.

Those with Grade 3 may require more frequent assessments and may have a **Time Limited** Certificate to monitor disease progression and be restricted to **Sheltered Waters**.

Alternatively, if there are any doubts, a clinical decision can be made with input from specialists and spirometry.

In all cases, ensure seafarers can effectively meet four pertinent requirements:

(a) adequate muscle strength to lift and carry a weight of 22 kg;

(b) the physical capacity to wear breathing apparatus and the seafarer's personal life-saving equipment while climbing ladders;

(c) the agility and strength to carry out the duties that may be assigned to them regarding fire fighting and vessel abandonment in an emergency; and

(d) the physical and mental fitness to meet the occupational and operational requirements of the position that they occupy or seek to occupy.

4.14 ANAPHYLAXIS AND ALLERGIES

Allergies are very complex and can present with a wide range of symptoms. There is a classification system and the focus is primarily with Type 1 Hypersensitivities. It includes atopic dermatitis, allergic Urticaria, Hay fever, Allergic asthma, Anaphylaxis from any source and IgE-mediated food allergies such as peanuts, eggs and seafood. These conditions may be either local or systemic with their symptoms ranging from a mild irritation to a full-blown Anaphylactic Reaction.

The key is to determine the severity of the reaction and the possibility of an exposure to an agent that could cause a life-threatening reaction. If there is a clear history of what the exact allergen is and precisely how the individual reacts, carry on and make a fitness determination. However, many times, the condition is never truly defined and if there is any question, send the seafarer back to his or her family doctor for a referral to an allergist to determine the facts. The allergist may have to provide an opinion.

If it is simply a Vespid reaction, it will likely not be an issue to your typical seafarer, but they may be stung while at a port. However, in this setting, you would have some expectation that medical services will be available in a near-by land-based facility.

Depending on the specific allergen and their reaction, you may have to declare the individual **Unfit**. However, if the condition allows, you can consider a limitation of:

'Must carry self-administered medications at all times'

'Avoid Specific Allergen _____'

Seafarers and Medical Certificates are portable. Make sure you indicate any limitations if they are deemed Fit as the Seafarer's workplace and exposures are prone to change.

Celiac Disease is not Type 1 hypersensitivity, but rather a Type 4 Cell Mediated Hypersensitivity mediated by T-cells. It may not be an urgent/life threatening condition, but it can lead to significant symptoms and dysfunction. For critical crew members you should consider placing a limitation of:

'Should avoid eating certain foods'

4.15 HIV / AIDS

Seafarers are not disqualified solely on the basis of this diagnosis. Many infected individuals will be quite well and may be so for many years. However, your focus should

be on function and the risk of the condition significantly deteriorating and requiring medical attention.

One issue is viral transmission. Exposure and acquisition is concerning, but it is questionable whether that alone is enough to bar them from a vessel crew. The main transmission routes of HIV are well established. It is possible to find HIV in the saliva, tears and urine of infected individuals, but there are no recorded cases of infection by these secretions, so the risk of infection via these routes is negligible.

There are a variety of ways to view and quantify this condition:

- Clinical stage
- Complications
- CD4 count

The World Health Organization Disease Staging System for HIV Infection and Disease was first produced in 1990 and updated in September 2005.

Stage I: HIV disease is asymptomatic and not categorized as AIDS

Stage II: include minor mucocutaneous manifestations and recurrent upper respiratory tract infections.

Stage III: includes unexplained chronic diarrhea for longer than a month, severe bacterial infections and pulmonary tuberculosis.

Stage IV: includes toxoplasmosis of the brain, candidiasis of the esophagus, trachea, bronchi or lungs and Kaposi's sarcoma; these diseases are used as indicators of AIDS.

The CDC Classification System for HIV now factors in the CD4 count (CD4 T-cell count below 200 cells/µl or a CD4 T-cell percentage of total lymphocytes of less than 14%) and AIDS defining illnesses that include:

- Candidiasis of bronchi, trachea, or lungs
- Candidiasis esophageal
- Cervical cancer (invasive)
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal for longer than 1 month
- Cytomegalovirus disease (other than liver, spleen or lymph nodes)
- Encephalopathy (HIV-related)
- Herpes simplex: chronic ulcer(s) (for more than 1 month); or bronchitis, pneumonitis, or esophagitis
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (for more than 1 month)
- Kaposi's sarcoma
- Lymphoma Burkitt's, immunoblastic or primary brain
- Mycobacterium avium complex
- Mycobacterium, other species, disseminated or extrapulmonary
- Pneumocystis carinii pneumonia
- Pneumonia (recurrent)
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia (recurrent)
- Toxoplasmosis of the brain

- Tuberculosis
- Wasting syndrome due to HIV

CD 4 counts can help predict risk. The major discriminating points are:

- **CD 4 < 200 High risk**
- **CD 4 > 350 Lower risk**

A specialist will have to weigh in and help you assess the seafarer's status. However, as a framework:

Stage 1(asymptomatic) and CD 4 > 350 **Fit.**

If one becomes symptomatic up to Stage 2 and the CD 4 remains greater than 350, **Fit with Limitations** specific to their circumstances. You may also want to issue a **Time** limitation.

A Seafarer beyond Stage 2 or with a CD 4 count **below 350** is **Unfit**.

4.16 HEPATITIS

Regardless of its cause, consider those with any Acute Hepatitis Temporary **Unfit**. Subsequently, it all depends on the underlying condition that influences the liver and any sequellae.

Most viral causes of Hepatitis resolve and leave no significant functional impairment, so you may deem the Seafarer **Fit**. However, others are left with ongoing impairment of liver function or complications such as cirrhosis or portal hypertension. You must request information from the patient's family doctor and Hepatologist and may place time limits to allow for follow-up. Depending on the outcome, you may consider some individuals **Unfit**.

Hepatitis C is unique. Between 60-70% of people infected develop no symptoms during the acute phase. In the minority of patients who experience acute phase symptoms, they are generally mild and nonspecific, and rarely lead to a specific diagnosis of Hepatitis C. The patient becomes unwell and symptomatic only when the disease impairs liver functions. It may be as little as some jaundice and fatigue, but may proceed to fulminant hepatic failure and require transplant.

Spontaneous viral clearance rates are highly variable and between 10–60% of persons infected with HCV clear the virus from their bodies during the acute phase as shown by normalization in liver enzymes in contrast to 95% of Hep B cases that resolve within 6 months. In the remainder, the immune system cannot manage the virus and they become chronic.

Those with chronic hepatitis frequently have no symptoms and the only differentiating factor would be elevated liver function tests. However, about a third remain ill, some develop cirrhosis and some develop hepatocellular carcinoma. Some individuals will undergo treatment with Interferon. Treatment can last up to a year.

The treatment with Interferon may be physically demanding, particularly for those with a prior history of drug or alcohol abuse. Many patients will experience side effects ranging from a 'flu-like' syndrome (the most common, experienced for a few days after the weekly injection of interferon) to severe adverse events including anemia, cardiovascular

events, and psychiatric problems. Deem individuals undergoing Interferon treatment temporarily **Unfit**.

Does the Hep C Viral Load have a role to play in your situation? It is an important factor in determining the probability of response to interferon-based therapy but it does not necessarily indicate disease severity nor the likelihood of disease progression.

4.17 THYROID

The fitness of a person with a thyroid condition depends entirely on function. If function is impaired, redirect the Seafarer back to their Family Doctor to correct the situation. Attention is required for any possible complications such as cardiac or emotional.

4.18 NEPHROLITHIASIS AND URINALYSIS

This condition may cause incapacitating pain and dysfunction. There is also the risk of obstruction. Someone with one remote stone form should simply remain vigilant. However, if such individuals have blood in the urine, or if they have recurrent stones, you must send them to their family doctor or urologist for an assessment. If at any time there is a risk of passing a stone, then placing a restriction of **Near Coastal Class II** would be appropriate.

There is some controversy regarding the benefits of a screening urinalysis. Recent reviews have failed to demonstrate any relevance as a screening test except in pregnant women. Not uncommonly, one spills some blood or protein in their urine, but does that really impact on one's fitness to be a seafarer?

For Seafarers, the purpose of this test is to screen for a condition that may develop or be exacerbated that will influence their function and safety of the ship. The burden of the Marine Medical Assessment is greater to pre-empt some conditions that may occur at sea.

For a young (less than 40), non-smoking, asymptomatic seafarer, a urinalysis revealing trace or 1+ blood will not affect their qualification. However, if it is a greater quantity, you must send the seafarer back to their family doctor for further investigation.

Glucosuria is not consequential in one who we know to be a diabetic as they will not uncommonly spill sugar. However, in the absence of a previous diagnosis of diabetes, you should send the seafarer back to their family doctor for further investigation and management before completing the Marine Medical Assessment.

4.19 SOLITARY KIDNEY

The Canadian Urological Association has no specific Occupational Guidelines for adults with Solitary Kidneys. Aside from reviewing the cause for having only one kidney, there are no limitations.

4.20 STROKE

This discussion primarily revolves around function. However, sudden incapacitation applies to stroke as well. This is especially the case when the outcome of the first

ischemic event in an individual with atrial fibrillation could be disabling in 60% of suffers and fatal in approximately 20% of them.

Strokes can be broadly classified as ischemic or hemorrhagic. The former is much more common, accounting for 88% of events. There are many causes of ischemic strokes, but the majority are the result of atrial fibrillation.

Regardless of the cause, if evidence suggests the patient will have a dramatic deterioration in their condition or have a significant risk of recurrence, deem them **Temporarily Unfit**. Send these seafarers back to the family doctor for appropriate investigation and management.

The $CHADS_2$ score is one of several clinical prediction tools for estimating the risk of one with atrial fibrillation developing a stroke. It is used primarily to determine the need for anticoagulation by stratifying risk.

You can use this tool for seafarers with atrial fibrillation not already anticoagulated. It is not a proven predictor for those already on anticoagulants, but one can extrapolate and use it to determine some degree of risk; knowing that there is an approximately 2/3 reduction in stroke prevalence while on therapeutic doses.

	Condition	Points
C	Congestive heart failure	1
H	Hypertension: blood pressure consistently above 140/90 mmHg (or treated hypertension on medication)	1
A	Age >75 years	1
D	Diabetes Mellitus	1
S_2	Prior Stroke or TIA	2

Annual Stroke Risk		
$CHADS_2$ Score	**Stroke Risk %**	**95% CI**
0	1.9	1.2–3.0
1	2.8	2.0–3.8
2	4.0	3.1–5.1
3	5.9	4.6–7.3
4	8.5	6.3–11.1
5	12.5	8.2–17.5
6	18.2	10.5–27.4

Gage BF, van Walraven C, Pearce L, et al. (2004). "Selecting patients with atrial fibrillation for anticoagulation: stroke risk stratification in patients taking aspirin", Circulation 110 (16): 2287–92.

Gage BF, Waterman AD, Shannon W, Boechler M, Rich MW, Radford MJ (2001). "Validation of clinical classification schemes for predicting stroke: results from the National Registry of Atrial Fibrillation", JAMA 285 (22): 2864–70.

If you determine that risk is minimal, assess if any neurological deficit is significant.

Deem any seafarer who recently suffered a stroke as **Temporarily Unfit**.

Once stabilized and 3 months have passed with no evidence of impending recurrence, you may reassess the Seafarer for duties.

Pursuant to the *MPR* a Seafarer is to meet the following standards:

a) adequate muscle strength to lift and carry a weight of 22 kg;

b) the physical capacity to wear breathing apparatus and the seafarer's personal life-saving equipment while climbing ladders;

c) the agility and strength to carry out the duties that may be assigned to them regarding fire fighting and vessel abandonment in an emergency;

d) the ability to work in constricted spaces and move through restricted openings of a maximum dimension of 600 mm by 600 mm; and

e) the physical and mental fitness to meet the occupational and operational requirements of the position that they occupy or seek to occupy.

For seafarers who have suffered a Transient Ischemic Attack, investigations are required to ensure it is not a signal of a more significant condition. By definition, it is a vascular compromise resulting in brief neurological dysfunction persisting for less than 24 hours. Symptoms vary widely. One third of people with a TIA later have recurrent TIAs and another third go on to develop a stroke.

The $ABCD^2$ determines very short-term risk for stroke after TIA. It may have limited use for a marine medical examiner, but it may give some guidance.

In general, deem anyone with recurrent TIA **Unfit** until they have undergone a complete Neurological assessment to determine the cause, have it rectified and determine any residual dysfunction.

$ABCD^2$ score					
	age	**blood pressure**	**clinical features**	**duration**	**diabetes**
0 points	<60 years	normal	other than those specified	less than 10 minutes	no diabetes
1 points	≥60 years	raised (blood pressure ≥140/90)	speech disturbance without weakness	10 to 59 minutes	diabetes present
2 points			unilateral (one-sided) weakness	≥60 minutes	

The risk for stroke can be estimated from the ABCD2 score as follows:

- Score 1-3 (low)
  - 2 day risk = 1.0%
  - **7 day risk = 1.2%**
- Score 4-5 (moderate)
  - 2 day risk = 4.1%
  - **7 day risk = 5.9%**
- Score 6–7 (high)
  - 2 day risk = 8.1%
  - **7 day risk = 11.7%**

Johnston SC, Rothwell PM, Nguyen-Huynh MN, et al. (January 2007). "Validation and refinement of scores to predict very early stroke risk after transient ischaemic attack", Lancet 369 (9558): 283–92.

4.21 CEREBRAL ANEURYSM

If a seafarer has a symptomatic cerebral aneurysm that has not been surgically corrected, they are **Unfit**. Once repaired, upon receipt of a favourable opinion for a neurosurgeon at the 6-month mark, they may be deemed **Fit**.

If an aneurysm is discovered incidentally and the patient is asymptomatic, they may be deemed **Fit** upon a favourable opinion from a neurologist or neurosurgeon.

4.22 MEDICATIONS

In general, unfitness for sea duties for medical reasons is dictated by the nature of an illness. Conditions of short duration such as pneumonia or a fracture, may dictate a temporary period away from work. Problems can arise when medications started during the illness are continued or new drugs are used to suppress or control resulting problems.

Medications that are prescribed by physicians for a specific condition may affect a seafarer's ability to perform safety sensitive duties. In these circumstances, the decision on fitness to work is often difficult.

Side effects of particular concern include; altered vision, impaired judgment, reduced attention span, diminished motor function, or altered response to an adverse environment during emergencies.

Many organizations have a lengthy list of medications that would be disqualifying, but one can realistically argue that ANY medication has the potential to impact on one's function and would require further assessment.

An exhaustive list of medications is impossible to produce, but some examples could include: Anti-depressants, Anti-emetics, Anti-motion sickness agents, Anti-psychotics, Anti-convulsants, Anti-histamines, Hypnotics and Sedatives, Medical use of Hallucinogens (medicinal marijuana), Muscle relaxants, and Opiates.

Specific examples that illustrate the difficulty of providing a finite list of medication include:

- The makers of Champix recently issued a safety bulletin regarding the side effects of the product that has resulted in seafarers being temporarily **Unfit** while using this product.
- The ILO/WHO Guidelines clearly address this issue. "Consumption of … psychotropic drugs which adversely affect the health of the seafarer or the safety of the ship" are grounds to justify restrictions or render the examinee temporarily or permanently unfit.

However, opiates and sedatives are **never** acceptable. Anyone on a regular dose of either of these products is not allowed to be responsible for any safety critical role, regardless of their history of stability. For those using these classes periodically, the use is forbidden within 48 hours of sailing.

When assessing Seafarers taking any medications, you must:

- Undertake a thorough review to ascertain any side effects
- Take appropriate action if their medications could interfere with function.

Note: Remind Seafarers that Section 113 of the *Canada Shipping Act, 2001* states, "every crew member on board a vessel shall carry out their duties and functions in a manner that does not jeopardize the safety of the vessel or of any person on board." This means that each seafarer is responsible for any possible side effects.

4.23 HERNIA

A hernia is not typically a barrier to work. It is the grey zone where you must exercise your judgement. If:

- there are incarcerated or strangulated contents involved; they require urgent surgical assessment and intervention before being deemed fit to work.
- it is small hernia defect, advise the candidate to follow up with their family doctor to have the issue addressed and to seek attention if there are any changes.
- you are concerned that the hernia ring is large and there is an increased potential for problems, consider issuing a 3 month Geographical Limitation such as **Near Coastal Class 2** on the certificate. A seafarer may return to duties after surgical correction and with support of a General Surgeon.

4.24 PNEUMOTHORAX

This is typically an acute condition in which a patient will not necessarily present for a Marine Medical Exam.

It most commonly arises:

- Spontaneously (most commonly in tall slim young males and in Marfan syndrome)
- Following a penetrating chest wound
- Following barotrauma to the lungs

- Iatrogenic causes such as pleural biopsies, bronchoscopies, line placements, positive-pressure ventilation

It may also be due to:

- Chronic lung pathologies including emphysema, asthma
- Acute infections
- Chronic infections, such as tuberculosis
- Lung damage caused by cystic fibrosis
- Cancer
- Rare diseases that are unique to women such as Catamenial pneumothorax (due to endometriosis in the chest cavity) and lymphangioleiomyomatosis

This condition commonly comes to light in the history. A single episode of a Pneumothorax with no other underlying condition or sequellae should not be a barrier. This is of course assuming the treating doctor at the time followed the condition and performed studies to illustrate resolution and no findings such as residual blebs existed that could be a reason for recurrence. An average of 30% of patients with a spontaneous Pneumothorax could experience a recurrence. This risk increases to 50% if they are a smoker.

If the history is within 3 months, the seafarer must provide x-ray evidence of resolution.

If there is a history of recurrence, more information will be required including a specialist note to consider any further management to correct a potential underlying problem.

4.25 PREGNANCY

Like other conditions, your role is to consider function and access to medical care. However, keep in mind that even a normal pregnancy that can be easily managed on shore can pose increased health risks at sea.

Pregnancy is perhaps a bigger issue for the employer to accommodate the seafarer's needs by making changes to the working conditions, hours on duty, shift work, and mitigating risks such as exposures and injuries.

Life on board ship has specific aggravating factors such as:

- Shocks, vibrations, movements
- Manual handling of loads
- Shift work
- Postures and travelling
- Electromagnetic fields?
- Temperature extremes
- Chemical exposures
- Carbon Monoxide

Pregnancy itself has its own particular health issues:

- Morning Sickness
- Backache
- Varicose Veins
- Hemorrhoids
- Frequency
- Fatigue

- Balance with an altered centre of gravity
- Increasing size and discomfort
- Preterm labour

Miscarriage is the most common complication of early pregnancy and often occurs before a woman knows she is pregnant. The demise of a pregnancy at any stage is not your sole concern. You must also consider the life threatening risks to the mother with hemorrhage and infection that could occur.

Assess each pregnant seafarer based on her condition and gestational age against her role, the vessel purpose (i.e., a chemical carrier), the duration of travel, the distance of proposed voyages; and make a reasonable decision. The seafarer's Obstetrician will have to weigh in, as well.

The seafarer must acknowledge the uniqueness of the work environment and be willing to take some personal responsibility and recognize the risks working at sea.

Postpartum usually spans 6 weeks, but again, make decisions on a case-by-case basis. Factors include a significant Post-partum bleed, potential retained products of conception, post-partum emotional changes.

General Guidelines:

Any complicated pregnancy requires a supportive report from an Obstetrician.

Pregnancies less than 24 weeks will be limited to **Near Coastal Class I**.

Pregnancies beyond 24 weeks will be limited to **Sheltered Waters**.

Seafarers must meet the Universal Requirements will still have to be met at any stage of pregnancy.

You must inform the seafarer of the risks so they can decide if they are willing to work at sea.

4.26 INFLAMMATORY BOWEL DISEASE

Seafarers with this condition may develop severe symptoms on short notice. They will frequently require specialist assessment and follow up. Not uncommonly, they will require supportive care.

If there is evidence of ongoing active disease, you should apply a geographical limitation such as **Near Costal 1**. However if the condition has been stable for a period of time, there has never been any hospitalization and there is a supportive report from their clinician, they may well be **Fit**.

4.27 AORTIC ANEURYSM

The rupture of an aortic aneurysm is catastrophic and requires urgent care. Seafarers detected to have an aortic aneurysm will require a vascular surgical assessment. Thus a medical certificate will have to set appropriate time limits to ensure follow-up every 6 to 12 months depending on the rate of growth of the aneurysm or as recommended by the surgeon.

Assess anyone with an Abdominal Aortic Aneurysm that is equal or greater that 5.5cm as **Unfit**. Other aneurismal sites will require vascular surgical opinion.

4.28 PERIPHERAL VASCULAR DISEASE

Intermittent claudication can certainly be symptomatic and affect one's function. A specialist report may be required to determine the need for intervention. A functional assessment will also be required to ensure the seafarer can meet the minimal universal requirements.

4.29 HEMOPHILIA AND OTHER CLOTTING DISORDERS

This group of conditions has a very broad expression and for obvious reasons, a specialist report will be required. As can be easily appreciated, these conditions can be challenging in a marine setting for the same reasons described in the section on anticoagulants.

Seafarers with a severe case will be deemed **Unfit**. For those with a milder case, upon receipt of supportive reports from their specialist, a geographic limitation of up to **Limited Contiguous Waters Voyage** will be required.

4.30 NEOPLASIA

The diversity of conditions and the variations of expression of this problem will require specialist input.

Restrictions may include time limitations for required follow up. Also, Geographical limitations are not unrealistic. If there were any significant impairment in function, then employment limitations such as **No Watchkeeping** would be necessary. Here are some very broad guidelines:

Unfit:	If undergoing active investigation and treatment.
Fit with Limitations:	If treated and apparent cure and low risk if within 5 years.
Fit:	If treated and no evidence of risk of recurrence or any impairment resulting from condition or treatment after 5 years.

5. CONCLUSION

The role as a Marine Medical Examiner has evolved and is not only to report medical facts but to make a fitness decision and provide that opinion to the Minister of Transport. The ultimate goal is to MINIMIZE RISK. That is why Transport Canada has the expectation that Marine Medical Examiners will:

- be familiar with its certification process and comply with its standards and requirements
- conduct a thorough medical examination and
- obtain any relevant documentation so that a proper assessment may be made with due regard to the examinees' medical condition and public safety.

The Marine Medical Exam is also a unique opportunity for you to promote health and educate your patients. You should:

- encourage all seafarers to maintain healthy lifestyles
- promote the role of primary health care providers and encourage regular checkups and
- inform the Seafarer of any medical documentation needed at their next assessment to prevent unnecessary delays at future assessments.

Transport Canada will conduct periodic reviews to keep this Guide current. We encourage Marine Medical Examiners to provide any feedback and opinions.

Marine Medicine hopes you find this guide useful and looks forward to continue working with you in the future.

ANNEX 1: SAMPLE LETTER TO SEAFARER

Marine Medical Examiner:

Date: _____

Dear Mr./Ms _____CDN # _____

Based on the marine medical examination performed on _____, and conforming to the *Marine Personnel Regulations* (MPR), you have been assessed as:

☐ Unfit

☐ Fit with the following Limitations:

_____
_____
_____
_____

This decision is based on the following information:

_____
_____
_____
_____
_____

As per the MPR, sub-section 278 (1), you have the right to request a reconsideration of this assessment within 30 days of receipt of this notice. Please address your request to Transport Canada:

Marine Medicine (AMSPM)
Transport Canada
330 Sparks Street
Ottawa, Ontario
K1A 0N8

Sincerely,

Dr. _____ MME # _____
c.c.: Transport Canada, Marine Medicine

ANNEX 2: PHYSICIAN'S REPORT FOR A DIABETIC SEAFARER

Patients Name_____CDN_____Date_____

Please provide further information regarding your patient's condition as part of a Marine Medical Assessment. There is limited access to medical services at sea that requires a Diabetic to understand and control their condition.

Note: Any expenses incurred to prove their medical fitness is the seafarer's responsibility.

1) How long have you treated this patient for Diabetes?

2) When was the initial diagnosis of Diabetes established?

3) Treatment required:

Diet □ Oral medications □ Insulin □

Please list all mediations and doses:

4) Does the patient carry out self 'blood' glucose testing?

YES □ NO □

5) Does the patient's glycemic log suggest good control of their Diabetes?

YES □ NO □

6) Does your patient understand the relationship between their condition, diet, exercise and medications?

YES □ NO □

7) Does your patient take appropriate action based on the 'blood' glucose levels?

YES □ NO □

8) Can your patient recognize a hypoglycaemic reaction if and when it occurs?

YES □ NO □

9) Please list the symptoms experience during a hypoglycaemic reaction:

10) Has your patent ever had any significant Hypoglycaemic events of which you are aware?

YES □ NO □

If "YES", please indicate the date and treatment (self-treated, hospitalized, etc):

11) Please provide current results of:

FBS AIC ACR Total Chol

TG HDL LDL Ratio

Exercise Stress Testing:

□ Unnecessary based on risk evaluation defined by Canadian Diabetic Association's Clinical Practice Guidelines

□ Date and outcome (or attach report):

12) Does your patient suffer any end-organ conditions?

Peripheral Neuropathy? □ Retinopathy? □

Cardiovascular? □ Nephropathy? □

13) Do you have any concerns regarding your patient's ability to perform their safety-critical job in a Marine Environment where they are inaccessible to Medical Services?

YES □ NO □

If "YES", Please indicate the reason,

THANK YOU,

Physicians Signature | Date

ANNEX 3: TABLE OF COMMONLY USED LIMITATIONS FOR MARINE MEDICAL CERTIFICATES

TYPE OF LIMITATION	NAME	APPLICATION/DEFINITION
DUTY	Definition of Watchkeeping (WK)	Refers to safety critical roles on a vessel that require unconditional cognitive and perceptual function. Anyone with a potential for the compromise of function may require a limitation
	No Watchkeeping	For anyone with risk of Sudden Incapacitation or risk of impaired cognition due to a medical condition or medications
	No Bridge Watchkeeping	For those who fulfill the requirements for another department but not for the bridge
	No Lone Watchkeeping	For those with possibly full perceptual functioning, but with an ongoing risk of temporary cognitive deficiencies
	Present Occupation Only	For those fulfilling the requirements for their present job only. A reassessment will be required to make a career change
MEDICAL	Corrective lenses required	When aid is required to meet the standard
	Hearing Aids required	When aid is required to meet the standard
	Specialized Electrical Equipment Required While Sleeping	Needs accommodations with an appropriate electrical outlet
	Must Carry Self-administered Medications	When needs life saving medication like Epipen, asthma medication
	To Avoid Specific Allergen	When Seafarers have significant allergies to certain agents
TIME	The maximal duration of a voyage___	May need regular treatment or medical follow up
	Not to be away from	Same as above

	Home Port Overnight	
	The maximal time away from a specified medical facility	Same as above
GEOGRAPHICAL **1**Nautical Mile(NM) equals 1.852 KM	Sheltered Waters Voyage	A voyage that is in Canada, on a lake or a river above tidal waters, where a vessel can never be further than one nautical mile from the closest shore
	Canadian Waters Voyage	A voyage that extends to Canadian Territorial waters to 12 Nautical Miles
	Inland Waters voyage	A voyage on the Inland Waters of Canada together with any part of any lake or river forming part of the inland waters of Canada that lies within the United States or a voyage on Lake Michigan
	Near Coastal Voyage, Class 2 (NC2)	A voyage within 25 nautical miles from shore in waters contiguous to Canada, the United States (except Hawaii) or Saint Pierre and Miquelon, and within 100 nautical miles from a place of refuge
	Near Coastal Voyage, Class 1 (NC1)	A voyage that is between places in Canada, the United States (except Hawaii), Saint Pierre and Miquelon, the West Indies, Mexico, Central America or the northeast coast of South America. A voyage during which the vessel is always north of latitude 6 degrees north and within 200 nautical miles from shore or above the continental shelf
	Limited Contiguous Waters Voyage (LCWV)	A variation of Near Coastal Class 1 limited to the waters contiguous to Canada, the United States (excluding Hawaii) and Saint-Pierre-et-Miquelon. Applicable for those individuals that do not meet International Standards, but can fulfill domestic requirements. Canada and the United States have a Memorandum of Understanding recognizing the other's certificates and thus voyages through United States' waters are permissible.
	Within ___ nautical miles from port	May need urgent medical care
	Voyage between Point A and Point B	Another way allowing those fulfilling the requirements for their present voyage only

ANNEX 4: REQUIRED LIMITATIONS APPLIED TO MARINE MEDICAL CERTIFICATES BY CONDITION

CONDITION	ASSESSMENT	LIMITATION
Altered awareness	Not yet diagnosed, ongoing investigation	UNFIT
	If there is a **potential** chance of: -Hypoglycemia with DM treatment -Vasovagals -Medication side effects	No Solo WK
Alcohol and Illicit Drugs	Evidence of significant issue	UNFIT
	After completion of a Rehabilitation Program: - a minimum of 3 months has passed - a supportive letter from a Primary Caregiver or Substance Abuse Specialist confirming abstinence every 3montns	TIME LIMITATION (3 months for a period of TWO years) +/- No WK
Anaphylaxis/ Allergies		Must carry self administered medication
Aneurysm	**<u>Cerebral</u>** Symptomatic	UNFIT
	- After surgery - At the 6-month mark	FIT
	- Incidentally finding asymptomatic supporting letter from specialist	FIT
	<u>Abdominal Aortic</u> > 5.5cm	UNFIT
	<u>Other sites</u> Require vascular surgical opinion	
Asthma	Intermittent, Mild Persistent, or Mild Exercise Induced and your assessment is supportive	FIT

	For all asthmatics that have ongoing use of medications.	Must carry self administered medications
	Moderate Persistent will likely require input from a specialist	FIT with Limitations likely Geographical
	Severe Persistent and Significant Exercise Induced	UNFIT
Cardiac	- B/P > 170/100 -New symptoms have to be investigated -< 3 month after an event or a cardiac procedure -Within One Month of implantation of Permanent Pacemaker	Temporally UNFIT
	-NYHC Class III or IV -Implanted Cardioverting Defibrillators (ICD) unless used prophylacticly based on positive genetic screening in low risk individuals (then **No Lone Watchkeeping** and **LCWV**) -Cardiac Transplant -Angiographic demonstration of >50% reduction in diameter of LC -Mobitz II Second and Third Degree heart blocks -VT of either hemodynamically unstable or LVEF < 35% -CHF with EF < 35%	UNFIT
Diabetes	Newly Diagnosed or Unstable	Temporarily UNFITt
	Hypoglycemia with treatment	No lone WK
	Insulin use	- LCWV - No WK first month of use
Hemophilia and other Clotting Disorders	Mild case	LCWV
	Severe case	UNFIT
Hepatitis	Acutely sick and that would include those undergoing treatment with Interferon	Temporarily UNFIT
	After Acute phase passes/no significant impairments to liver function and end-stage complications	FIT
Hernia	Small hernia defect	FIT
	Large hernia ring	Geographical Limitation

HIV	Stage 1 (asymptomatic) and CD 4 > 350	FIT
	Stage 2 and the CD 4 > 350	FIT With Limitations
	Beyond Stage 2 or a CD 4 < 350	UNFIT
IBD	Evidence of ongoing active disease	NC I
Job specific	For those fulfilling the requirements for their present job only.	Present Occupation Only
Medication	**Anticoagulant**	NC2
	Antimetabolites and Biologicals	LCWV
	Champix	Temporarily UNFIT
	Immunosuppressant	LCWV
	Insulin	-LCWV and No WK first month of use
	Interferon	Temporarily UNFIT
	Opiates ongoing use	UNFIT
	Opiates PRN but not within 48 hours of sailing	FIT
	Sedatives ongoing use	No WK
	Sedatives PRN but not within 48 hours of sailing	Fit
Neoplasia	If undergoing Active investigation and treatment	UNFIT
	If treated and apparent cure and low risk if within 5 years.	FIT +/- limitations
	if treated/ no evidence of recurrence/ no impairment from condition or treatment after 5 years	FIT
Nephrolithiasis	If there is any risk of passing a stone	NC II
Obesity	If unable to meet Universal Requirements	UNFIT
Pneumothorax	Single episode of a Pneumothorax and confirmatory X ray	FIT
	Recurring episodes with supportive documentation	FIT

Pregnancy Universal Requirements must met at any stage of pregnancy	less than 24 weeks	NC I
	beyond 24 weeks	Sheltered Waters
Psychiatry	- Significant risk of recurrence - Severe impairment - Significant side effects - 2 psychotic episodes	UNFIT
	Schizophrenia/ schizoaffective disorder/Bipolar I	UNFIT
Seizure	Childhood Febrile Seizure	FIT
	New or Ongoing Seizure, Ongoing Investigation	UNFIT
	Seizure-free with or without Rx for 6 months	NC I No WK
	Seizure-free with or without Rx for 12 months	No WK
	Seizure-free with or without Rx for 5 Years	FIT
	Special circumstances	See Text
Sleep disorders	**Narcolepsy and Restless Leg Syndrome**	No WK
	Obstructive sleep apnea Stable CPAP	Specialized Electrical Equipment Required While Sleeping
	Symptomatic not treated	No WK
	Surgery and asymptomatic	FIT
Solitary kidneys		FIT
Stroke	Minimum three months after event	Temporarily UNFIT
	Once stabilized and meet Universal Requirements	FIT
Urinalysis	**Hematuria:** Trace or 1+ blood Young (less than 40)/ non-smoking/asymptomatic no stone history	FIT
	Glucosuria In non diabetic will require diabetic assessment	

Universal requirements	a) adequate muscle strength to lift and carry a weight of 22 kg b)the physical capacity to wear breathing apparatus and the seafarer's personal life-saving equipment while climbing ladders; c)the agility and strength to carry out the duties that may be assigned to them regarding fire fighting and vessel abandonment in an emergency; d)the ability to work in constricted spaces and move through restricted openings of a maximum dimension of 600mm by 600mm; e)the physical and mental fitness to meet the occupational and operational requirements of the position that they occupy or seek to occupy.	FIT

Objective standard :VISION* and HEARING

*When there is no diplopia, no night blindness, no progressive eye disease

UNCORRECTED ACUITY

FOR ALL SEAFARERS	**< 20/200**	using one or both eyes	UNFIT
	> 20/200	and requires correction	Corrective lenses required

CORRECTED ACUITY

DECK	< 20/40	both eyes	No WK
	< 20/40	one eye only	LCWV
ENGINE	< 20/50	both eyes	No WK
	< 20/50	one eye only	No Bridge WK
CATERING AND OTHER	≥ 20/200	in both or either eye alone	Present Occupation Only

Exception group **engine who held an Engineer Certificate of Competency issued before July 30, 2002**	No Bridge WK

COLOUR VISION

Standard for All Seafarers Ishihara Passed Ishihara Failed but Farnsworth D 15 Passed	No WK if not met
Exception group - engineer who held an Engineer Certificate of Competency before July 30, 2002. - seafarer who: A)is not required to hold a certificate of competency to perform their duties on board a vessel; or B)is required to hold one of the following certificates to perform their duties on board a vessel: (i) Engine-room Rating (ERR) (ii) Ship's Cook (iii) Proficiency in Fast Rescue Boats (iv) Proficiency in Survival Craft and Rescue Boats Other Than Fast Rescue Boats (v) Restricted Proficiency Survival Craft and Rescue Boats Other Than Fast Rescue Boats (vi) Oil and Chemical Tanker Familiarization (vii) Liquefied Gas Tanker Familiarization (viii) Passenger Safety Management (ix) Specialized Passenger Safety Management (x) Compass Adjuster.	No Bridge WK for Engineers and Group B(i) No WK for group A and group B (ii – x)

HEARING	
Standard for All Seafarers -ability to adequately hear conversation -Hearing aids and Monaural hearing are permitted -If fail screening audiogram must be provided -average of no more that 30 dB loss in the better ear for the frequencies of 500, 1000,2000, and 3000 Hz -Hearing aid users q2years assessment confirm standard is met	No WK if not met
Exception group engine who held an Engineer Certificate of Competency issued before July 30, 2002	No Bridge WK

ANNEX 5: USEFUL LINKS FOR MARINE MEDICAL EXAMINERS

Marine Personnel Standards and Pilotage (AMSP)	http://www.tc.gc.ca/MarineSafety
The Guidelines for Conducting Pre-sea and Periodic Medical Fitness Examinations for Seafarers	http://www.ilo.org/public/english/dialogue/sector/techmeet/ilowho97/index.htm
Marine Personnel Regulations, 2007(MPR)	http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-115/?showtoc=&instrumentnumber=SOR-2007-115
CDN Information	http://www.tc.gc.ca/eng/marinesafety/bulletins-2010-05-eng.htm
Marine Safety Transport Canada Centers	http://tcinfo/marinesafety/regions/menu.htm
Canada Shipping Act 2001	http://laws-lois.justice.gc.ca/eng/acts/C-10.15/index.html
Transportation Appeal Tribunal of Canada	http://www.tatc.gc.ca/
The Canadian Diabetes Association's Clinical Practice Guidelines	http://www.diabetes.ca/files/cpg2008/cpg-2008.pdf
AUDIT (Alcohol Screen)	http://whqlibdoc.who.int/hq/2001/who_msd_msb_01.6a.pdf