Transport for NSW

Freight, Strategy and Planning

Standard for Health Assessment of Marine Pilots (NSW)

December 2016

Transport for New South Wales

Standard for Health Assessment of Marine Pilots NSW 2016

Acknowledgement:
Based on NTC National Standard for Health Assessment of Rail Safety Workers 2017 (with permission).

Note: The National Standard for Health Assessment of Rail Safety Workers is subject to periodic review. Changes will be considered for relevance to the Standard for Health Assessment of Marine Pilots (NSW) as they occur and will be incorporated if appropriate to the inherent requirements of the marine pilot's task.

FOREWORD

This revised *Standard for Health Assessment of Marine Pilots (NSW)* represents a significant step in the continuous improvement of safety in shipping in NSW.

The Standard was first introduced in 2009 bringing in a uniform health standard for marine pilots in NSW. The revision of the Standard is the result of extensive research, audit findings and input from a wide range of government, industry and medical stakeholders.

The Standard is a non-prescriptive, performance-based standard which adopts a risk management approach. It reflects contemporary medical knowledge and current understanding of the impact of certain health conditions on safe working performance and addresses the deficiencies identified in recent safety investigations. Contemporary anti-discrimination and privacy principles legislated in Commonwealth of Australia and NSW have been taken into account.

Assessments of marine pilots' health against this Standard are conducted by Authorised Health Professionals that have been accredited by Transport for NSW and demonstrate knowledge of inherent requirements of marine pilotage, the Standard and the health assessment procedures.

The new Standard consists of five parts:

Part A – Introduction

This section explains how the Standard fits within the regulatory scheme of the Marine Safety Act 1998, its associated Regulations and the NSW Marine Pilotage Code.

Part B – The Health Assessment System

This part describes the overall health assessment system, reporting framework and quality control. The section specifies timing and frequency of health assessments.

Part C – The Inherent Requirements of Marine Pilots

This section explains the inherent requirements of marine pilots' tasks and the health attributes required to perform these tasks. This forms the basis of the Health Assessment Standard.

Part D – Procedures for Conducting Health Assessments

Part D provides guidance to Authorised Health Professionals for conducting the health assessments of marine pilots. It provides an overview of the health assessment procedures.

Part E - Medical Criteria

This section is for use by Authorised Health Professionals. It describes the medical criteria to be applied for judging fitness for duty.

Transport for NSW acknowledges significant contribution made by Dr Bruce Hocking and Ms Fiona Landgren in leading the project and revising the Standard. Transport for NSW thanks the Port Authority of NSW, NSW marine pilots, the Australian Maritime Officers Union, health professionals and other representatives who generously participated in the working group and provided valuable input.

Clare Gardiners-Barnes
Deputy Secretary
Transport for NSW

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Ms Fiona Landgren

Pilotage Working Group
Transport for NSW
Port Authority NSW Sydney
Port Authority NSW Newcastle
Port Authority NSW Port Kembla
Port Authority NSW Marine Pilots
Sydney Pilot Service
Australian Maritime Officers Union

CONTENTS

FIGURES

TABLES

PART A – INTRODUCTION

1 Overview of the Standard

Note: This section explains how the Health Assessment Standard fits within the regulatory scheme of the Marine Safety Act 1998, its associated Regulations and the NSW Marine Pilotage Code. It also describes interfaces with other legislation, policies and programs relating to the health and safety of marine pilots.

1.1 Status

The Standard is a minimum standard. Should an agreement be reached at an enterprise level, the Standard does not preclude more comprehensive or frequent health assessments. However, those who do implement alternative approaches should consider issues such as anti-discrimination laws and industry interfaces (refer to Section 3.2, Anti-discrimination Legislation).

1.2 Purpose

Marine pilots are critical safety workers, which means their action or inaction may lead directly to a serious incident affecting the public or the maritime environment.

The health of marine pilots is therefore an important consideration for public safety, property, economic prosperity and the environment, as well as for the work health and safety of themselves and their fellow workers.

The health attributes required for marine pilotage match the inherent job requirements as outlined in this Standard and may be considered in two main categories:

- Psychological capacity, including:
    - cognitive capacity for situational awareness, navigation, pilotage and decision making tasks;
    - communication skills for effective teamwork, cultural awareness, interpersonal relationships, and clear and easily understandable communication; and
    - the ability to respond effectively in emergency situations.
- Physical capacity, including:
    - general physical fitness and physical capacity for embarking / disembarking ships and the other physical requirements of pilotage.

A system for monitoring and managing the health of marine pilots has been established to address the risk of ill health. Specifically the system aims to:

- ensure pilots are capable of the inherent requirements of the job at the time of initial licensing; and
- ensure their ongoing fitness for duty.

Health assessments are one aspect of an integrated port operations risk management system aimed at achieving safety in the maritime environment.

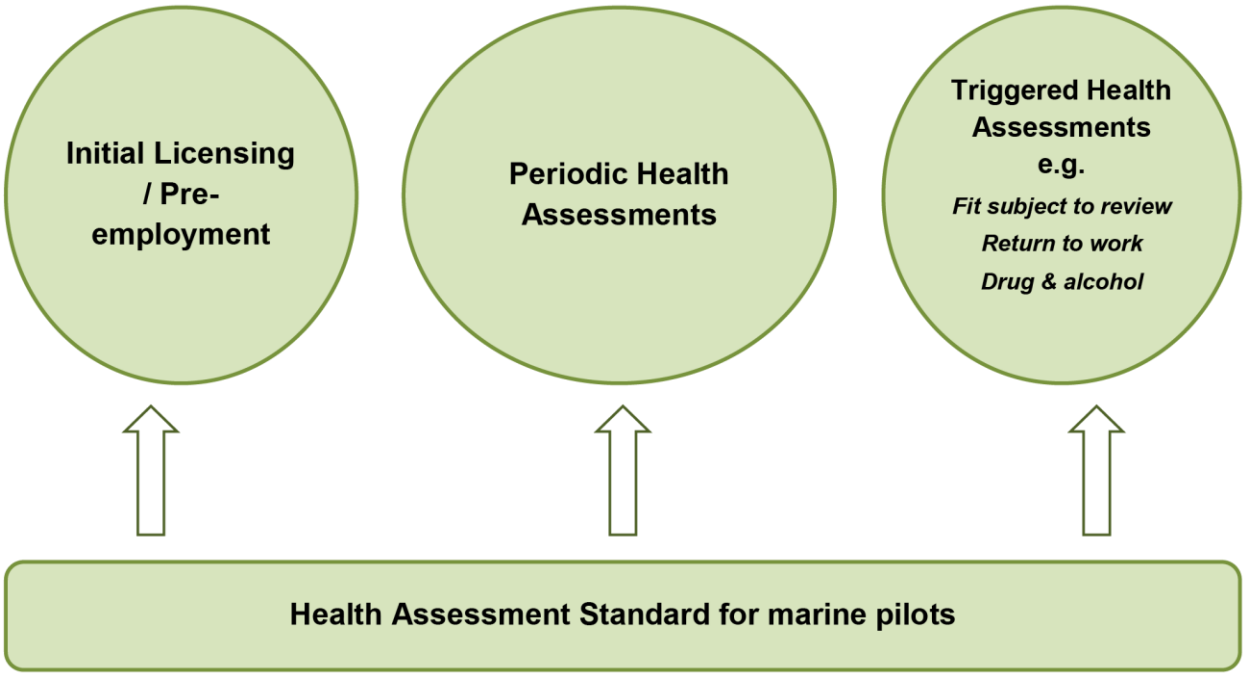
1.3 Application and scope of the Health Assessment Standard

In order to ensure marine pilots meet the level of health required for performing the inherent requirements and demands of their position, health assessments may be conducted at various points during their employment.

This Standard is used as a basis for all health assessments conducted to assess medical fitness for duty of marine pilots including:

- at initial licensing – in order to confirm that the health and fitness of an applicant is suited to the tasks to be performed;
- for Periodic Health Assessments conducted in order to monitor the pilot's health during employment and detect conditions that might affect safety and delivery of service;
- for other assessments conducted to determine or monitor fitness for duty (Triggered Health Assessments), including:
    - review assessments to enable monitoring of conditions that might impact on fitness for duty;
    - health assessments conducted to determine fitness for duty following illness, injury or extended sick leave; and
    - any other health assessment that might be prompted by concerns about the pilot's health during their employment (refer to Section 6.1.3 Triggered Health Assessments).

Figure 1 The Health Assessment Standard supports consistent assessment of fitness for duty across the career of marine pilots



The Standard focuses on medical fitness to perform the inherent requirements of piloting duties. It does not cover other work health and safety matters such as work exposures, nor does it cover aspects such as fatigue or critical incident management, although the interfaces with these are recognised (refer to Section 3 Interfaces with other health and human resources programs and legislation including the NSW Marine Pilotage Code).

1.4 Structure of the Standard

The Standard for Health Assessment of Marine Pilots (NSW) comprises the following parts:

A. **Introduction:** A description of the purpose, scope and context of the Standard, including roles and responsibilities.
B. **Health Assessment System**: A description of the overall health assessment system and the requirements for application.
C. **Inherent Requirements:** A description of the inherent requirements and health attributes which form the basis of the Health Assessment Standard.
D. **Health Assessment Procedures:** A description of the assessment procedures for conducting health assessments for marine pilots. It is intended mainly as a reference for examining health professionals. The Port Authority should develop procedures to support conduct of the administrative aspects.
E. **Medical Criteria:** A description of the medical criteria to be applied for judging fitness for duty. The medical criteria are presented in chapters corresponding to body system or disease categories and are arranged alphabetically.

The appendix includes model forms.

2 Development and maintenance

This Standard is based on the evidence-based *National Standard for Health Assessment of Rail Safety Workers (2016)*[1] developed by the National Transport Commission, and has been adapted where appropriate to address the specific inherent requirements and risks of marine pilotage. This enables some uniformity in standards across various safety critical industries.

Where contributing professional organisations and experts have provided more current references to support changes to the Standard, these have been incorporated. Where evidence was lacking, expert opinion from members of specialist medical colleges and other health professional organisations provides the basis for this Standard.

The Standard will be reviewed periodically to ensure it aligns with developments in medical management and changes in the inherent requirements of pilotage.

[1] National Transport Commission. National Standard for Health Assessment of Rail Safety Workers, 2017 https://www.ntc.gov.au/rail/safety/national-standard-for-health-assessment-of-rail-safety-workers/ [accessed December 2016]

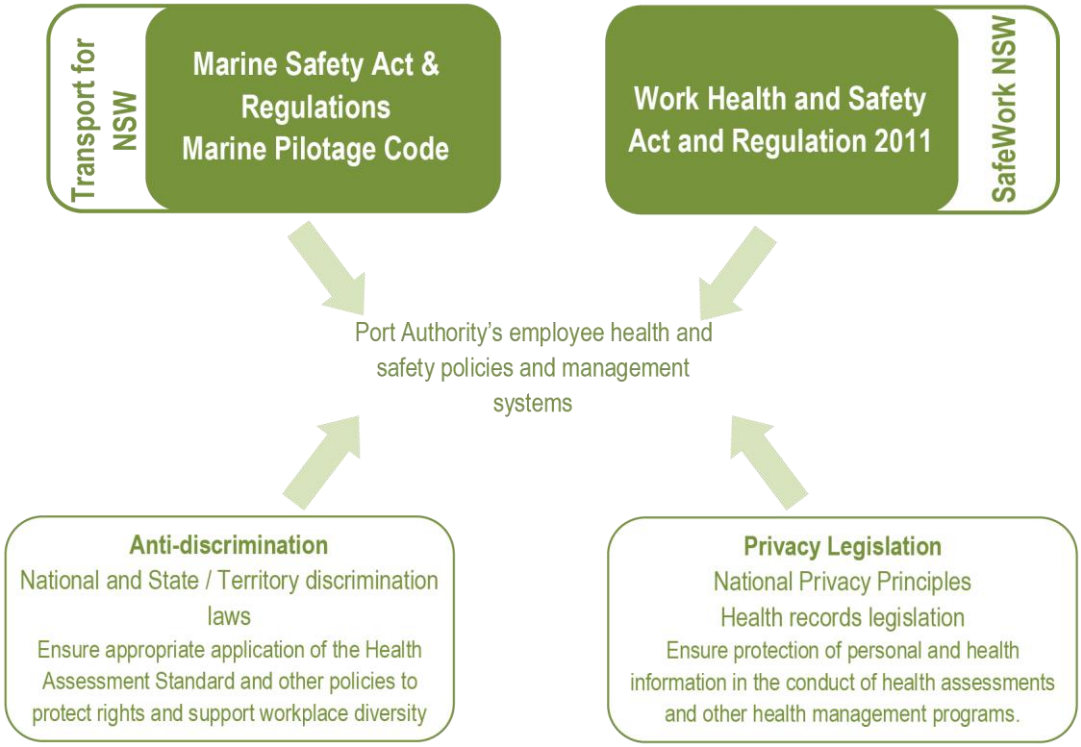
3 Interfaces with other health and human resources programs and legislation including the NSW Marine Pilotage Code

Health assessments interface specifically with a range of other health and human resources programs, as well as with quality and risk management systems, legislation and international conventions. The legislative interfaces are shown in Figure 2. The interfaces with health and human resources programs are illustrated in Figure 3. Interfaces should be identified and managed by the Port Authority to increase the effectiveness of health assessment programs and to reduce duplication.

3.1 Work Health and Safety legislation

Work Health and Safety (WHS) legislation[2] imposes a general duty of care on the Port Authority and marine pilots regarding risk management and therefore integrates with the Marine Safety Act[3] and the NSW Marine Pilotage Code[4]. The focus of the Standard is principally the assessment of health and fitness to perform the pilotage task. The Standard addresses requirements for an individual pilot's safety but it does not include or replace health monitoring required under WHS legislation. In particular, there are WHS requirements for occupational exposure to noise (see case study below), lead and asbestos. These should be addressed by the Port Authority and should interface with the health assessment system as required.

Figure 2 Legislative context



[2] Work Health and Safety Act 2011 and Regulation, http://www.austlii.edu.au/au/legis/nsw/consol_act/whasa2011218/ [accessed 26 September 2016]
[3] Marine Safety Act 1998, as at 28 June 2016, http://www.austlii.edu.au/au/legis/nsw/consol_act/msa1998145/ [accessed 26 September 2016]
[4] New South Wales Marine Pilotage Code, Revise October 2015, http://freight.transport.nsw.gov.au/documents/nsw-marine-pilotage-code-volume-one.pdf [accessed 26 September 2016]

Figure 3 Interfacing health and human resources programs

Case Study – Noise Exposure

Marine pilots are assessed for hearing ability to ensure they can communicate and so work safely. In addition, the Work Health and Safety Regulation 2011 requires audiometric testing at defined times for pilots exposed to certain noise levels. Thus, a 30-year-old pilot may only require 5-yearly marine pilot health assessments, yet must have 2-yearly audiometric testing if noise exposure warrants it, for example excessive exposure to noise from helicopters. The Port Authority must identify such overlaps and manage the process to ensure compliance.

3.2 Anti-discrimination legislation

Anti-discrimination legislation[5] must be considered by the Port Authority when implementing health assessment systems. The requirements include:

- Health assessments must focus on inherent job requirements, not peripheral requirements. The risk assessment must guide the health assessment process.
- For certain conditions it may be necessary to demonstrate that the condition prevents the pilot from performing the required piloting tasks, for example through practical tests for hearing, neuropsychological conditions or musculoskeletal capacity.
- Any required tests should be valid and their criteria must have a clear rationale. That is, the test must be a good predictor of serious illness regarding safety.
- If a Standard must be met at entry, it should be maintained during employment and examined for periodically.
- If a criterion is not met, the Port Authority should consider reasonable adjustments to the workplace to accommodate the disability.

While public safety considerations take precedence over anti-discrimination, this does not exempt the Port Authority from addressing discrimination issues.

[5] Anti-Discrimination Act 1977 No 48, http://www.legislation.nsw.gov.au/#/view/act/1977/48 [accessed 26 September 2016]

3.3 Privacy legislation

In administering the marine pilots' health assessments, the Port Authority must ensure compliance with the Australian Privacy Principles[6] and must ensure that health records are managed and stored in line with the *Health Records and Information Privacy Act 2002* [7]and its associated Regulation. Provisions for these specific requirements are described in Section 8.3 Privacy laws.

3.4 Drug and alcohol controls

The Port Authority has a responsibility to ensure that marine pilots are not impaired by alcohol or drugs when performing their work. Marine pilots themselves also have a duty not to perform piloting duties while impaired by alcohol or drugs.[8][9]

Health assessments have a role in identifying problems associated with dependence, and in identifying and managing the potential effects of prescribed treatment on the pilot's fitness for duty. Health assessments interface with, but should not substitute, policies to monitor or control drug and alcohol use by marine pilots (refer to Section 25 Substance misuse and dependence).

3.5 Injury management, sick leave, return to work and rehabilitation

Policies and procedures for injury management, sick leave, return to work and rehabilitation interface with health assessments for marine pilots. For example, a pilot on an injury management program will have to undergo a health assessment under this Standard (Triggered Health Assessment) to determine fitness for piloting duties. The Standard will be helpful to the rehabilitation provider in developing treatment plans.

Pilots returning from extended sick, maternity or other types of leave may also be required to have a health assessment under this Standard in order to establish their fitness to undertake piloting duties (refer to Section 6.1.3 Triggered Health Assessments).

3.6 Incident management

The Port Authority may have counselling and support programs available for pilots involved in incidents and near misses affecting the safety of ships and the marine environment. Periodic Health Assessments provide a further opportunity to review pilots' responses to incidents and to assess general psychological wellbeing. Interfacing these programs supports the effectiveness of the health assessment process and incident management overall.

[6] Office of the Australian Information Commissioner, National Privacy Principles https://www.oaic.gov.au/privacy-law/privacy-act/australian-privacy-principles [accessed 24 April 2016]
[7] Health Records Information Privacy Act NSW, 2002 http://www.legislation.nsw.gov.au/#/view/act/2002/71 [accessed 25 July 2016]
[8] New South Wales Marine Pilotage Code, October 2015
[9] Marine Safety Act 1998, as at 28 June 2016, http://www.austlii.edu.au/au/legis/nsw/consol_act/msa1998145/ [accessed 26 September 2016]

3.7 Employee assistance programs

Personal and work-related issues can affect work performance. Employee Assistance Programs (EAPs) are available to help pilots and their families resolve these issues via independent and confidential professional counselling. There is potential for referral to EAP by the Authorised Health Professional (refer to Section 22 Psychiatric conditions).

The availability of EAP and other mental health support programs should be promoted to pilots.

3.8 Fatigue management

Fatigue is an important consideration for risk management in maritime ports. The NSW Pilotage Code outlines responsibilities of the Port Authority and pilots in this regard.

Health assessments have a role in identifying health problems as a possible cause of fatigue. The opinion of an Authorised Health Professional may be sought in appropriate cases by a triggered referral (refer to Section 6.1.3 Triggered Health Assessments).

Periodic Health Assessments may detect sleep apnoea syndrome which manifests itself as a tendency to doze at inappropriate times when intending to stay awake. Assessments may also support sleep hygiene education (refer to Section 24 Sleep disorders).

3.9 Health promotion and health surveillance

The health and fitness of marine pilots may be supported by health promotion programs. These might typically include heart health, nutrition and weight control, physical fitness, mental health, smoking cessation and skin cancer prevention programs. Health promotion programs however should not be confused with health assessments for fitness for duty.

4 Responsibilities and relationships

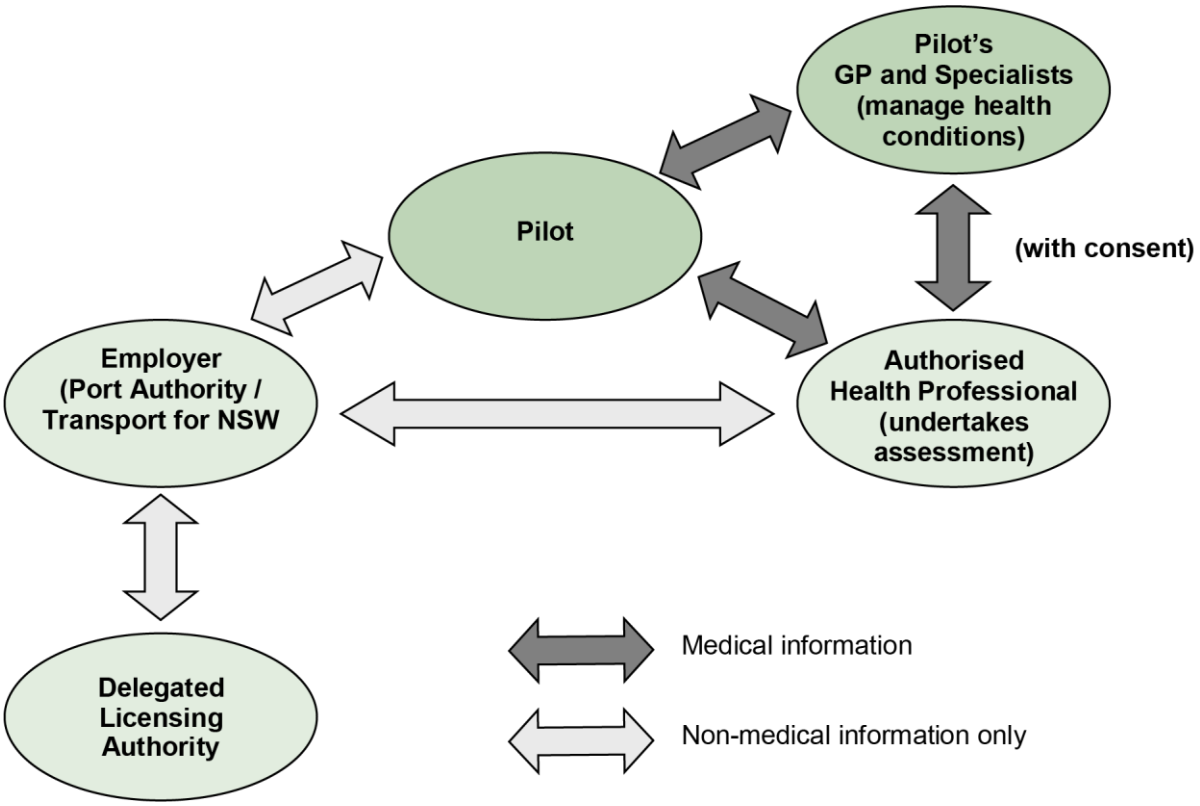
The successful implementation of the Health Assessment Standard for marine pilots relies on a clear understanding of the various responsibilities as well as effective communication between the individuals/groups involved. Such communication, including management of health records, should be consistent with the provisions of relevant privacy and health records legislation (refer to Section 8.3 Privacy laws).

Following is a summary of the responsibilities of the key parties and their interrelationships. Figure 4 illustrates these relationships and the flow of information that should take place in conducting health assessments for marine pilots.

4.1 Transport for New South Wales

The Minister for Roads Maritime and Freight issues the Port Authority of NSW with a Port Safety Operating Licence (PSOL). The PSOLs set out performance standards for a range of safety functions, including marine pilot licensing. Transport for NSW plays an active role in monitoring the effectiveness of the PSOLs through its participation in formal auditing of the Port Authority.

Figure 4 Relationships in the implementation of health assessments for marine pilots



4.2 Port Authority of New South Wales

The Port Authority manages the navigation, security and operational safety needs of commercial shipping on Sydney Harbour, Port Botany and Port Kembla and the ports of Newcastle, Eden and Yamba.

As the employer and licensing authority for marine pilots (under delegation from the Minister for Roads Maritime and Freight), the Port Authority has a responsibility to protect the safety of the public. This includes a responsibility to ensure that the health and fitness of pilots is monitored and does not jeopardise marine safety.

As an employer, the Port Authority also has a duty of care under WHS legislation to the health and safety of their pilots.

The final decision regarding fitness to hold a pilots' licence rests with the Port Authority.

Where possible, subject to reasonable operational requirements, the Port Authority will accommodate the limitations of the pilot's capabilities due to health issues through strategies such as job modifications, alternative duties or supervision as appropriate.

The Port Authority also has a responsibility to ensure privacy principles are maintained with respect to pilots' personal and health information (refer to Section 8.3.1 Privacy policy).

If employing contractors, the Port Authority is required to inform them of their obligations to ensure appropriate health assessment systems are in place for their marine pilots.

4.3 Marine pilots

Marine pilots have a duty of care to themselves and others. They should know their job, its implications for safety and the importance of their health and fitness to marine safety. They have a responsibility to notify the Port Authority of any temporary or ongoing health condition or change in health status that is likely to affect their ability to perform their work safely. They must also comply with any review requirements of a health assessment and they are obliged to be truthful in imparting health information to the examining Authorised Health Professional.

Marine pilots may request referral to an Authorised Health Professional if they are concerned about their ability to perform their work safely due to health reasons.

4.4 Authorised Health Professionals

Health assessments for marine pilots should only be conducted by Authorised Health Professionals who meet the criteria outlined in Table 1.

The method of appointment and quality control is determined by Transport for NSW in consultation with the Port Authority. The criteria used by Transport for NSW should be consistent with *Guidelines on the Medical Examinations of Seafarers, ILO/IMO/JMS/2011/12.*

The Authorised Health Professionals should conduct health assessments in line with the procedures contained in this Standard.

The relationship between the health professional and the pilot/patient is governed by the ethics of the relevant health profession and by privacy laws. The relationship differs from the usual doctor-patient relationship because of the involvement of a third party, the Port Authority.

The Authorised Health Professional should not provide personal or medical information to the Port Authority, only information regarding work capacity (refer to Section 8.3.3 Information disclosure; 8.7 Communication with Pilots).

The Authorised Health Professional should liaise with the pilot's general practitioner and treating specialists where appropriate to clarify information relating to the pilot's current health status. Such communication should occur with the consent of the pilot and should be limited to health issues that impact on marine safety (refer to Section 8.3.3 Information disclosure; 8.7 Communication with Pilots).

Where specialist referral is required to determine a marine pilot's fitness for duty, the referral should be made by the Authorised Health Professional and they should request that the report be copied to the pilot's general practitioner. The specialist should be briefed regarding the requirements of the Standard. Where a pilot is already seeing a specialist, referrals for specialist opinion or further investigation for fitness for duty may be made to that specialist. Referrals made for the ongoing management of the pilot's health should be made by the treating doctor, not by the Authorised Health Professional.

The ongoing treatment and management of medical conditions is the responsibility of the pilot's general practitioner. Authorised Health Professionals should communicate and consult with the general practitioner and other relevant providers to ensure the effective management of the pilot's health.

Table 1 Criteria for selection of Authorised Health Professionals

Table 1 Criteria for selection of Authorised Health Professionals
Qualifications and experience: The health professional must be a registered medical practitioner and should have appropriate experience or qualifications in occupational medicine.
Marine industry knowledge: The health professional should demonstrate a working knowledge of the pilotage environment including work performed and risks involved.
The Standard: The health professional should demonstrate familiarity with the *Standard for Health Assessment of Marine Pilots (NSW),* including: • appreciation of the role of health assessments in ensuring marine safety; • specific knowledge of the inherent requirements of the marine pilot's job and the rationale for health assessments applied; • knowledge of and ability to perform the Marine Pilot Health Assessment; • understanding of requirements and reporting options for fitness for duty; • knowledge of the administrative requirements of health assessments, including form completion and record keeping; • understanding of ethical and legal obligations and the ability to conduct health assessments accordingly, including appropriate communication with the pilot and the Port Authority; and • understanding of ethical issues in relationships with the treating doctor/general practitioner.
Interfacing policies and programs: The health professional should be able to demonstrate awareness of legislation, policies or programs that might interface with or affect the performance of the health assessment, for example, drug and alcohol policy, critical incident management programs, anti-discrimination legislation and privacy legislation.

4.5 Medical specialists

This Standard generally requires marine pilots who are assessed Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. The report from the specialist provides an input into the decision regarding ongoing fitness for duty. The specialist should be familiar with the requirements of the Standard in relation to the condition in question.

In certain circumstances, the Authorised Health Professional, with the knowledge and agreement of the specialist, may determine that review by a pilot's treating general practitioner is sufficient if there is an established pattern of compliance and good response to treatment. The initial granting of Fit for Duty Subject to Review must be based on information provided by a specialist. These circumstances are identified in this Standard. Where appropriate and available, the use of telemedicine technologies such as videoconferencing is encouraged as a means of facilitating access to specialist opinion.

PART B – THE HEALTH ASSESSMENT SYSTEM

5 Risk management approach

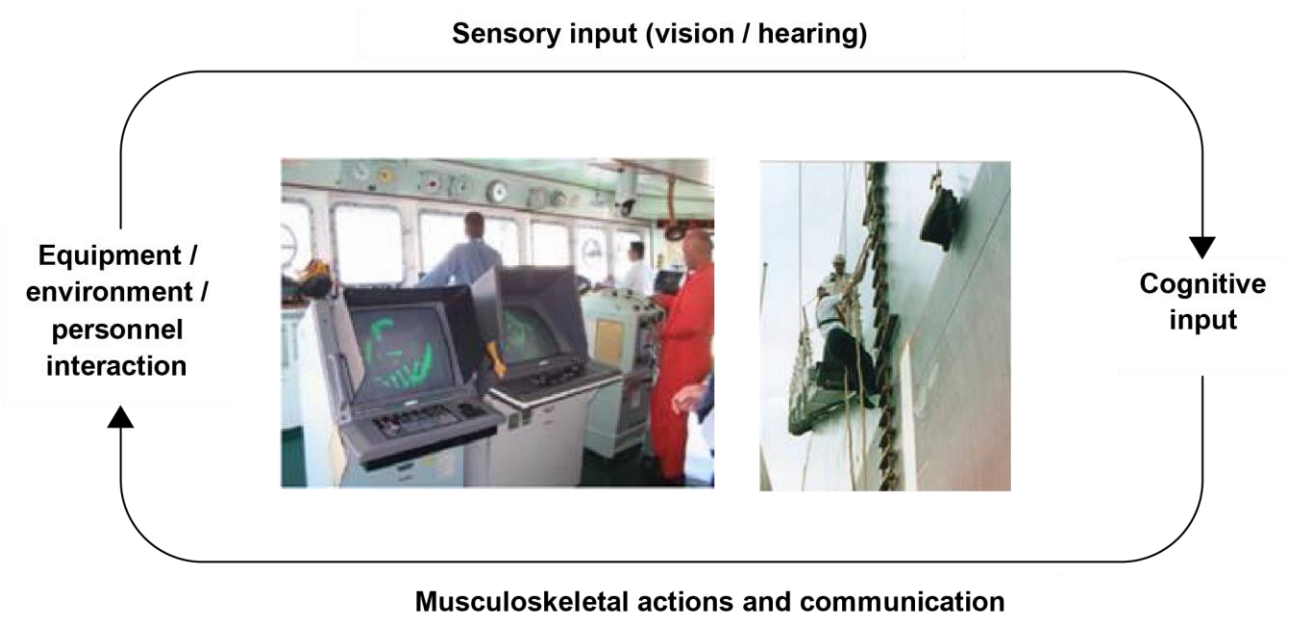
The requirements for marine pilot health assessments have been determined by a risk management approach, which ensures the level and frequency of health assessments conducted is commensurate with the risk associated with the tasks performed.

Figure 5 shows the ergonomics of the marine pilot's job, and provides a framework for understanding and applying a risk management approach to health assessments. It shows that information is gained about the pilotage task by the senses (mainly vision and hearing); the information is then processed by the brain (cognition, or 'situational awareness') and decisions are made that are then put into effect by the musculoskeletal system to alter the operation of the system. This cycle rapidly repeats. These processes take place within the operational environment of pilotage.

The aim of the health risk management process is to:

- identify what could go wrong in the case of physical or psychological ill health;
- assess the consequences; and
- establish appropriate controls for the risks associated with ill health.

Figure 5 The main tasks and health attributes required for pilotage and dis/embarking



The health risk management process focuses on a consideration of the extent to which the pilot's physical or psychological health could contribute to a serious incident that may result in:

- the death of a person; or
- incapacitating injury to a person; or
- a collision involving ship; or
- any other occurrence that results in significant property damage.

A further consideration is the extent to which the pilot's health affects their own safety and that of fellow pilots or the public.

Health assessments are one approach to treating the risk of serious incidents and the risk to individual safety, thus a mix of engineering, administrative and health assessment measures is likely to be required. When determining the health assessment requirements of pilots, it is important to take into account the operational and engineering environment, since overall risk management significantly determines the human attributes that are required for safety.

This interaction between technology and human capabilities has implications not only for the setting and application of health standards, but also for meeting diverse legal requirements. Health assessment standards cannot be simply set at the highest level for safety's sake. They must be set and applied carefully to match the risks associated with the tasks to be consistent with anti-discrimination and privacy laws. This requires careful and thorough assessment of the risks to health—and as a consequence of health—as part of the assessment process. There also needs to be periodic reviews of the technology and of medical knowledge in managing risk.

6 Features of the health assessment system

The health risk management system defined in this Standard features a number of key elements:

- **Defined timing and frequency of health assessments**. Timing and frequency of health assessments is defined to support early detection of health conditions and appropriate management to support long-term fitness for duty.
- **Health assessments matched to the inherent requirements and health attributes of pilotage.** Health assessments assess the health attributes of pilotage and identify medical conditions that are likely to impact on safety (refer to Part C Inherent requirements of marine pilotage). In turn, specific medical criteria for various medical conditions are defined to ensure consistency of application.
- **Standard reporting framework.** A standard reporting framework for fitness for duty (or otherwise) supports consistency of application.

6.1 Timing and frequency of health assessments

The timing and frequency of health assessments supports a risk management approach. A rigorous health assessment system should:

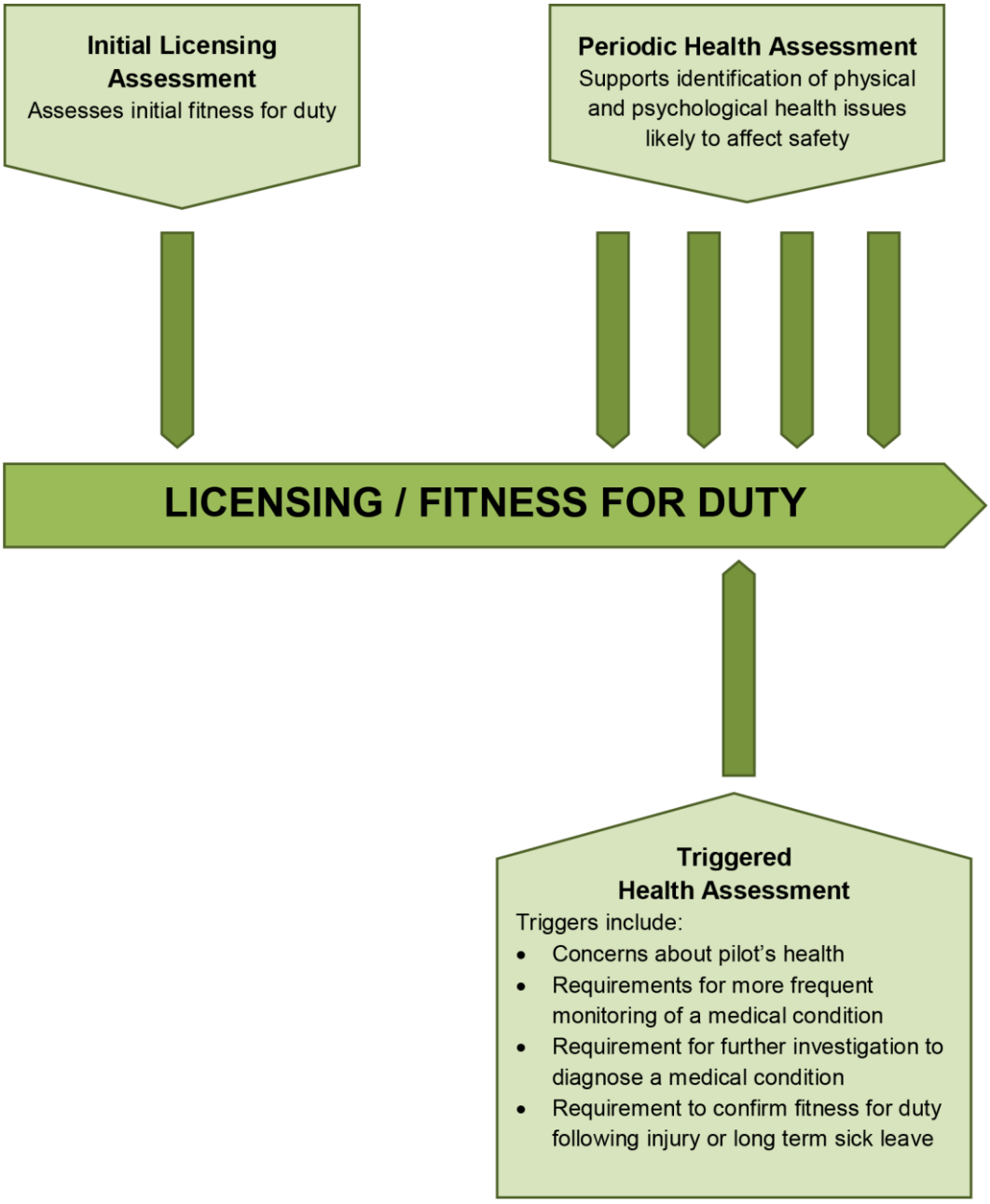
- confirm that the health and fitness of a pilot candidate is suited to the tasks to be performed;
- periodically monitor the pilots health during employment to detect conditions that might affect safety; and
- enable timely response to concerns about the pilot's health.

There are therefore three types of health assessments for marine pilots (Initial licensing, Periodic and Triggered).

- ***Initial Licensing Assessments*** aim to confirm that a marine pilot candidate is medically suited to the tasks to be performed;
- ***Periodic Health Assessments*** monitor the marine pilot's health during employment to detect conditions that might affect safety; and
- ***Triggered Health Assessments*** enable a timely response to concerns about the pilot's health.

Figure 6 shows how the different types of health assessments work together to support ongoing fitness for duty. The health assessments are described in more detail below.

Figure 6 Health assessments supporting fitness for duty of marine pilots



6.1.1 Initial Licensing Health Assessments

Marine pilots require a health assessment as a condition of initial licensing. The assessments are aimed at determining a pilot's fitness for duty based on the inherent requirements (refer to Part C – Inherent requirements of marine pilots).

6.1.2 Periodic Health Assessments

Periodic Health Assessments aim to identify health conditions that may affect safe performance of piloting duties. They should be conducted for marine pilots according to the defined frequencies, from the time of initial licensing:

- yearly to age 50 then
- 2 yearly to age 60 then
- Yearly thereafter

The program of comprehensive Periodic Health Assessments should be maintained even if more frequent Triggered Health Assessments are performed for an individual's particular condition.

6.1.3 Triggered Health Assessments

Triggered Health Assessments overlay the scheduled Periodic Health Assessments and enable early intervention, appropriate management and timely monitoring of health problems that are likely to affect safety.

Referral for a Triggered Health Assessment may be prompted by a number of different circumstances. In turn, these circumstances will determine the nature and extent of the health assessment required, as illustrated in the following examples.

Assessments related to more frequent monitoring of a medical condition (Fit for Duty Subject to Review)

As a result of a Periodic Health Assessment, a pilot may be diagnosed with a condition that requires more frequent monitoring to ensure that they remain well enough to conduct pilotage work e.g. diabetes, sleep disorder. A health assessment will be triggered to be conducted more frequently than the Periodic Health Assessment (for example, every 12 months). This will be noted on the health assessment report provided by the Authorised Health Professional.

The extent of this Triggered Health Assessment will be determined by the nature of the condition, and a full assessment (as required for Periodic Health Assessments) is not necessarily required. For example, for a pilot with sleep apnoea, it may be sufficient for the Authorised Health Professional to review a printout of the pilot's Continuous Positive Air Pressure (CPAP) machine. For more complex conditions, a more comprehensive assessment may be required, including review of reports from treating specialists.

The nature and extent of the health assessment in these circumstances will depend on the individual's condition and the status of their treatment, and will be determined by the Authorised Health Professional. The Port Authority should request a Triggered Health Assessment based on advice provided by the Authorised Health Professional in the previous health assessment report. It is not the responsibility of the Port Authority to determine the extent of the assessment required.

Assessments relating to further investigation to diagnose/treat a medical condition (Fit Subject to Review or Temporarily Unfit for Duty)

Similar to above, a Periodic Health Assessment may flag the need for further investigation or treatment to establish fitness for duty or to treat a specific condition. The pilot may be categorised Temporarily Unfit for Duty or Fit Subject to Review while tests are being conducted or while specialist opinion is being sought about a particular condition. The Authorised Health Professional will request a review to consider these further inputs. This triggered review will be specific in nature and will relate to the condition or treatment in question. It will not comprise another full assessment.

The Port Authority should request a Triggered Health Assessment based on advice provided by the Authorised Health Professional in the previous health assessment report. It is not the responsibility of the Port Authority to determine the extent of the assessment required.

Health assessment triggered by concerns about a pilot's health

Triggered Health Assessments provide an opportunity to investigate health concerns that arise between Periodic Health Assessments. The Port Authority should be alert to indicators of ill health, such as recurrent absenteeism, repeated incidents and recent traumatic events, and should discuss these with the pilot. This may lead to referral for health assessment, retraining in competencies or referral to an Employee Assistance Program.

The pilot themselves may also request a health assessment if they have concerns about their ability to work safely due to a medical condition, or due to treatment such as medication.

The nature and extent of the health assessment in these circumstances will depend on the presenting symptoms and circumstances and will be determined by the Authorised Health Professional. The Port Authority should request a Triggered Health Assessment and provide sufficient information for the examining doctor to determine the assessment requirements. It is not the responsibility of the Port Authority to determine the extent of the assessment required.

Triggered Health Assessments in relation to ongoing Periodic Health Assessments

Triggered Health Assessments do not forego the requirement for regular Periodic Health Assessments. Full Period Health Assessments should be conducted according to the timeframes prescribed in the Standard. The triggered assessment process should not result in a change in the scheduling of the prescribed Periodic Health Assessments, unless the Triggered Health Assessment has comprised a full assessment as defined for Periodic Health Assessments, in which case future Periodic Health Assessments should be scheduled from the date of the full assessment.

Triggered Health Assessments may interface with a range of other performance management strategies including retraining and employee assistance.

To ensure appropriate referrals and transparency in decision-making, the Port Authority should develop clear referral criteria for Triggered Health Assessments.

Table 2 Summary of health assessment requirements for marine pilots

Type of Health Assessment Required	Frequency
Initial Licensing Health Assessments Health Assessment including: • Marine Pilot Health Questionnaire and history • Vision and hearing assessment • Cardiorespiratory fitness test (VO_2 max) and musculoskeletal assessment • Comprehensive clinical examination including physical and psychological aspects and a Cardiac Risk Level Additional health assessments may be implemented to meet WHS requirements.	***On commencement***
Periodic Health Assessments Health Assessment including: • Marine Pilot Health Questionnaire and history • Vision and hearing assessment • Cardiorespiratory fitness test (VO_2 max) and musculoskeletal assessment • Comprehensive clinical examination including physical and psychological aspects and a Cardiac Risk Level Additional health assessments may be implemented to meet WHS requirements.	***5 yearly to age 50*** ***2 yearly to age 60*** ***Yearly thereafter*** Note: Depending on the needs of the pilot, Authorised Health Professionals may also recommend more frequent assessments for health surveillance. Ongoing treatment and management of medical conditions should continue to be the responsibility of the pilot's general practitioner.
Triggered Health Assessments Nature of health assessment will depend on the triggering circumstances.	As determined by circumstances

6.2 Health assessments matched to inherent requirements and health attributes of pilotage

Marine pilots are required to undergo a comprehensive physical and psychological assessment at initial licensing (Initial Licensing Health Assessment) and periodically during employment (Periodic Health Assessment).

These assessments aim to determine the pilot's ability to meet the general physical and psychological demands of the tasks. The assessment comprises a health questionnaire and a general clinical examination. Referral for further tests or a further medical opinion may be required.

The assessment may also include drug screening depending on the requirements of the Port Authority.

6.2.1 Health questionnaire

This self-administered questionnaire (refer to Appendix 1) collects a general history and helps screen for specific conditions that might affect marine pilot performance, including:

- psychological problems (K10 Questionnaire);
- sleep disorders (Epworth Sleepiness Scale); and
- alcohol dependency (AUDIT Questionnaire).

The questionnaire also seeks information about:

- whether the pilot has experienced difficulty in performing piloting work;
- whether they have been involved in any accidents or near misses at work; and
- whether they have tested positive to drugs or alcohol in the period since their last assessment.

The questionnaire is not diagnostic and no decision should be made regarding fitness for duty until the clinical examination is complete.

6.2.2 General clinical examination

The clinical examination assesses the key health attributes required for marine piloting work. There are two main aspects of the piloting task: the skills required on the bridge to navigate the vessel, and the skills required to dis/embark the vessel (refer to Part C – Inherent requirements of marine pilots).

Detailed instructions for carrying out the clinical examination are included in Part D – Procedures for conducting health assessments.

6.2.3 Practical tests

In some situations, a clinical assessment may need to be supplemented by a practical test to confirm fitness for duty. For example, practical tests for musculoskeletal capacity may be applied to confirm the pilot's alibility to conduct the particular tasks required. Practice pilot ladders are available on land in Sydney and Newcastle.

Stress tests may be designed to further assess capacity. Neuropsychological capacities may be assessed on computer simulators or scale models or other means. Refer to Section 14.8 Additional tests and marine specific resources.

6.2.4 Drug and alcohol screening

The Port Authority has a responsibility to ensure that marine pilots are not impaired by alcohol or drugs when performing their work. Marine pilots themselves also have a duty not to perform piloting duties while impaired by alcohol or drugs.

Initial Licensing Health Assessments may include a drug screen if this is required by the Port Authority. Periodic Health Assessments generally do not include a drug screen. However, assessment for drug or alcohol dependence is an aspect of the Periodic Health Assessment.

The Standard includes guidance and criteria for Authorised Health Professionals to assess drug or alcohol dependence as well as guidance for managing a situation where acute drug or alcohol impairment is suspected at a Periodic Health Assessment (refer to Section 25 Substance misuse and dependence).

Triggered Health Assessments may interface with a range of other performance management strategies including retraining and employee assistance.

To ensure appropriate referrals and transparency in decision-making, the Port Authority should develop clear referral criteria for Triggered Health Assessments in relation to drug and alcohol use.

7 Standard reporting framework – Fitness for duty categories

Fitness for duty is expressed in terms of one of a number of categories as described below and summarised in Table 3.

Table 3 Health assessment outcome categories for marine pilots – Interpretation for recruitment, ongoing fitness for duty and licensing

OUTCOME CATEGORY	INTERPRETATION		
	Initial licensing	**Ongoing Fitness for Duty**	**Ongoing licensing/ renewal**
Fit	Fit to obtain a pilot's licence – no restriction.	Fit to continue piloting duties – no restriction.	Fit to continue to hold a pilot's licence – no restriction.
Fit Subject to Review	Fit to obtain a pilot's licence (must have more frequent periodic assessment and meet conditional medical criteria).	Fit to continue piloting duties but requires more frequent periodic health assessments and must meet conditional medical criteria.	Fit to continue to hold a pilot's licence (must have more frequent periodic assessment and meet conditional medical criteria).
Fit Subject to Job Modification	N/A	Fit to continue piloting duties if job can be suitably modified (this is usually a temporary measure).	N/A
Temporarily Unfit	Not fit to obtain a pilot's licence. May reapply when health issue satisfactorily addressed.	Not fit to continue piloting duties, pending appropriate management of health issue.	Not a licensing issue. Person will continue to hold licence but will not undertake pilot's duties until medically cleared.
Permanently Unfit (Unfit for duty >1yr)	Not fit to obtain a pilot's licence.	Not fit to continue piloting duties in the foreseeable future.	Not fit to hold a pilot's licence in the foreseeable future.

*If the health assessment cannot be completed satisfactorily, the pilot should be categorised as Temporarily Unfit. The pilot and the Port Authority should be advised.

Note that:

- determinations may be combined; and
- a particular pilot may move from one category to another as they progress through the medical assessment and investigation process.

Fit for Duty Unconditional

This indicates that the person has met all the criteria in the Standard and is to be reviewed in line with the normal Periodic Health Assessment schedule.

Temporarily Unfit for Duty

This indicates that the pilot has not met all criteria in the Standard and cannot undertake piloting work at present but may do so in the near future. This category may be applied for a number of different reasons. It may be that a condition has been found and it is anticipated that it will improve with treatment. The pilot would be reviewed following treatment to determine fitness status. This differs from ordinary short-term illness causing absence from duty.

It may also be applied in situations where a clear diagnosis has not been made in the case of an undifferentiated illness, for example where a pilot is being investigated for blackouts. The Authorised Health Professional should advise the Port Authority about the duration of the period for review (so that roster changes can be made). A pilot who is assessed as Temporarily Unfit for Duty may be assessed fit for non-safety critical alternative duties (i.e. non-piloting duties) or may be judged fit subject to job modification).

In the case of Initial Licensing Health Assessments, an applicant judged Temporarily Unfit for Duty would not be considered fit to hold a license, however they may be reassessed in the future if the medical issue(s) were to be resolved, for example by obtaining glasses to meet the visual requirements of the Standard.

Given this advice, the licensing authority / recruitment manager may advise the applicant that they may reapply in the future.

Fit for duty – Conditional

This category indicates that the pilot is fit for duty conditional on them wearing/using items such as spectacles or hearing aids.

Fit for Duty Subject to Review

This category indicates that the person has not met all the criteria in the Standard, however the condition in question is sufficiently under control that normal duties may be permitted. Continuation of normal duties would be conditional on the person being reviewed more frequently than the Periodic Health Assessment schedule requires (Triggered Health Assessment). The review period is specified by the Authorised Health Professional.

This category may also apply as a provisional category for a newly diagnosed condition, which does not pose an immediate risk to safety but requires further investigation. In this situation, pilots must undergo prompt assessment to determine their ongoing status and be definitively categorised.

An applicant may be categorised Fit Subject to Review at initial licensing indicating that employment would be conditional on them attending more frequent health assessments than required for a standard Periodic Health Assessment.

Fit for Duty Subject to Job Modification

This category indicates that the person has not met all the criteria in the Standard, but could continue piloting duties (or, in the case of a new recruit, be judged medically suitable for piloting duties) if suitable modifications were made to the job, subject to reasonable operational requirements.

It is recognised that in most cases suitable job modification may not be practicable for marine pilots. Modification should be considered on a case by case basis and the subject is covered in general terms within any Enterprise Agreement. For example, in some situations, where helicopter transfer is available, work may be limited to this mode for an agreed time. Other WHS requirements such as capacity for underwater escape will need to be considered. A health professional may also recommend roster changes in cases of fatigue.

The period required for job modifications is decided based on discussion between the Authorised Health Professional and the Port Authority.

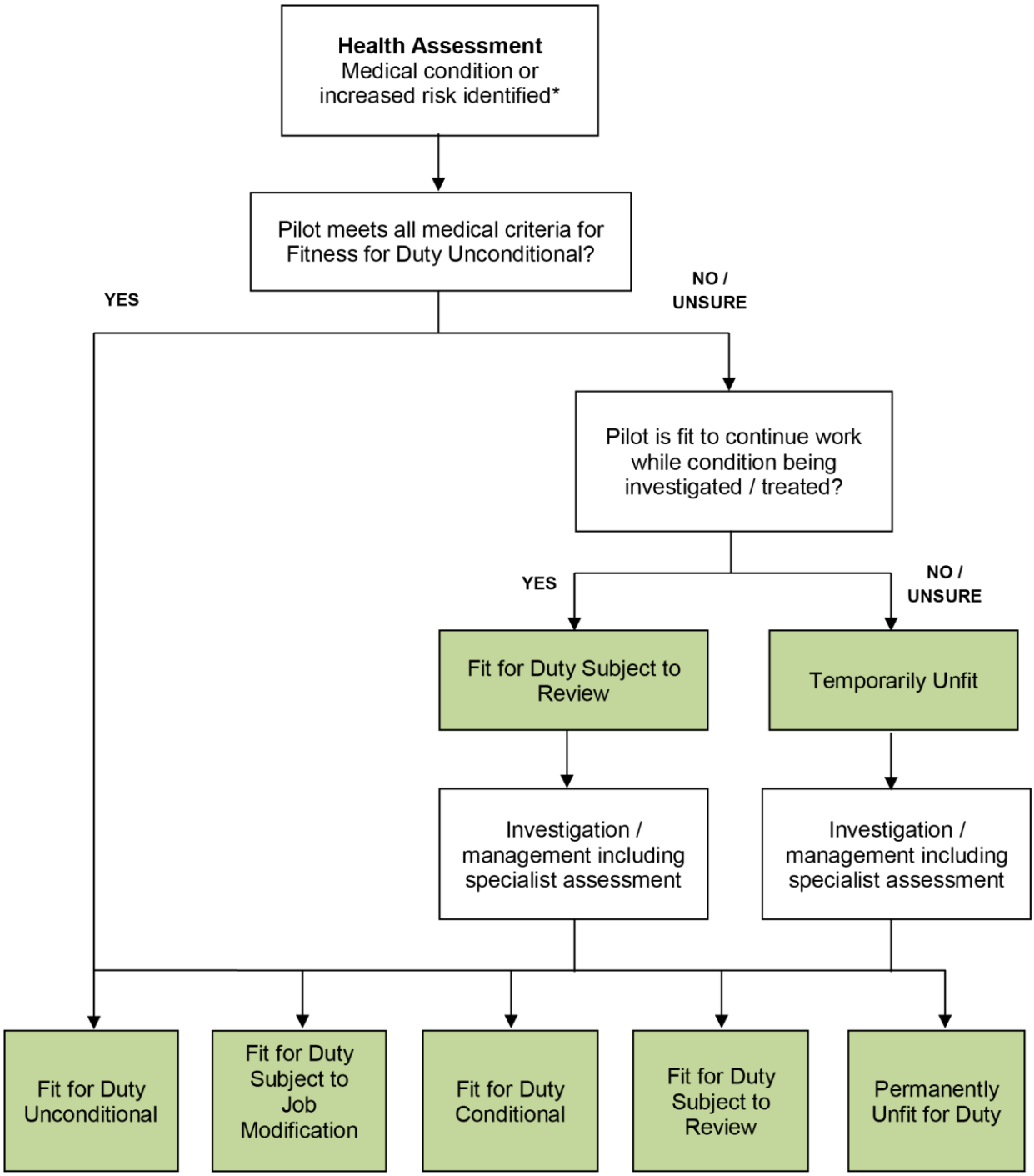
Permanently Unfit for Duty

This category indicates that the pilot has not met all criteria in the Standard, their condition is likely to be long term (12 months or more) and they will not be able to undertake piloting work in the foreseeable future. Options for redeployment to other work compatible with a pilot's health condition / capabilities may be considered on a case by case basis. This category is likely to have an impact on pilot licensing. The subject should be covered in general terms within any Enterprise Agreement.

Failure to complete health assessment

If the health assessment cannot be completed satisfactorily the person should be categorised as Temporarily Unfit for Duty. The pilot and the Port Authority should be so advised.

Figure 7 Reporting framework (applied to newly identified medical condition)



* If the health assessment cannot be completed satisfactorily the pilot should be categorised as Temporarily Unfit for Duty. The pilot and the Port Authority should be advised accordingly.

8 Administrative systems

8.1 Health assessment procedures

The Port Authority should establish appropriate procedures to guide administration of the health assessments in line with this Standard.

8.2 Health assessment database

The Port Authority should establish an appropriate database to support administration of the health assessments in line with this Standard.

The database should be secure and comply with privacy legislation (refer to Section 8.3 Privacy laws) and should identify for each pilot:

- the date of the last health assessment, the nature of that assessment (e.g. Initial Licensing, Periodic or Triggered) and the result (e.g. Fit for Duty, Fit Subject to Review);
- the due date for the next Periodic Health Assessment;
- the due date for the next Triggered Health Assessment as required (e.g. Fit Subject to Review, return to work etc.);
- any restrictions or conditions on the pilot's fitness for duty, such as wearing glasses or having more frequent health assessments for monitoring purposes; and
- any other information that will assist in the appropriate management of the health assessments and the health of the pilot.

It should be managed so that timely reminders to supervisors and pilots are issued and followed up.

A pilot's health assessment status must be kept confidential and released only as required to the pilot, the supervisor and the Authorised Health Professional.

8.3 Privacy laws

In administering the marine pilot health assessments Transport for NSW, the Port Authority and Authorised Health Professionals must comply with the Privacy Principles contained in privacy legislation and must ensure that health records are managed and stored in line with the *Health Records and Information Privacy Act 2002* (the Act).

8.3.1 Privacy policy

The Act requires organisations to have a privacy policy for health information. This includes provision for ensuring pilots are clearly informed about:

- the purpose for collecting and storing the health information;
- what information will be stored and where;
- the fact that they can access it; and
- to whom the information may be disclosed.

8.3.2 Primary purpose

Only information justifiably necessary to assess fitness for duty should be collected. Thus, the Port Authority cannot ask an Authorised Health Professional to collect information that is not relevant to the health requirements of the piloting task.

Similarly, information must only be disclosed for the primary purpose for which it was collected. Thus, the Port Authority cannot provide the Authorised Health Professional with information that is not relevant to the health assessment. Authorised Health Professionals also cannot provide information back to the Port Authority that is not relevant to management of the pilot and their fitness for duty.

8.3.3 Information disclosure

Health information should be reported on a need to know basis from a health professional to the Port Authority.

The Authorised Health Professional must not disclose the pilot's clinical records to the Port Authority. Pilot consent must be obtained to disclose any health information to a third party unless permitted by law as with workers' compensation.

The Port Authority needs to understand how a pilot's ability to undertake their job might be affected by a health condition (e.g. their ability to climb a pilot's ladder, their ability to see instruments or their ability to hear radio communication). They do not need to know the exact nature or details of the underlying medical conditions (e.g. high blood pressure, otosclerosis, diabetes) or how it is being managed.

Thus, the Authorised Health Professional is not prohibited from giving the Port Authority advice about fitness to perform specific tasks, provided he or she does not refer to the pilot's medical details. However, it is possible that in seeking to manage a medical condition, such as during the Port Authority's discussions with the pilot regarding alternative duties or job modification, the diagnosis may become self-evident.

When appropriate, it is helpful if the consent of the pilot can be gained to disclose the nature of the condition(s) to the Port Authority to facilitate a sensible plan of health management.

Where an Authorised Health Professional seeks information from a pilot's general practitioner or treating doctor to clarify the pilot's current health status, such communication should occur with the consent of the pilot and should be limited to health issues that impact on the ability of the pilot to undertake tasks.

8.3.4 Maintenance and storage of information

Information should be kept accurate, up to date and protected from loss and unauthorised use. Records may be scanned and kept in electronic form. The pilot's signature on the completed health questionnaire is legally valid after scanning. Similarly, this applies to the Authorised Health Professional signature.

8.3.5 Audit

A Transport for NSW authorised medical consultant may access the complete individual health records for the purposes of audit in order to ensure consistency and quality of health assessments for marine pilots. Where such records are accessed, confidentiality must be assured and systems must be in place to ensure internal personnel do not access records. The report should be in aggregate terms not about individuals (refer Section 9 Quality control).

Similarly, a pilot's personnel record in relation to health assessments may be accessed by a Transport for NSW authorised auditor.

8.4 Health assessment forms

Model forms are provided in Appendix 1 as a template for the Port Authority to develop their administrative processes and procedures. There are three forms:

- Health Assessment Request and Report form (Blue Form);
- Health Assessment Notification and Health Questionnaire (Pink Form); and
- Health Assessment Record for Authorised Health Professional (Green Form).

The forms are colour-coded (blue, pink, green) to facilitate use by the Authorised Health Professional and the Port Authority.

Administrative detail on the forms may be altered consistent with a Port Authority's requirements. The provisions for reporting from the Authorised Health Professional to the Port Authority (on the Blue Form) and the content of the Health Questionnaire (on the Pink Form) represent standardised data collection and should not be altered.

The model forms are also consistent with privacy principles. The Port Authority should ensure any changes made to the forms are consistent with the *Health Records and Information Privacy Act 2002*. Use of the forms is described below and in Figure 8.

8.4.1 Health Assessment Request and Report Form – Blue Form

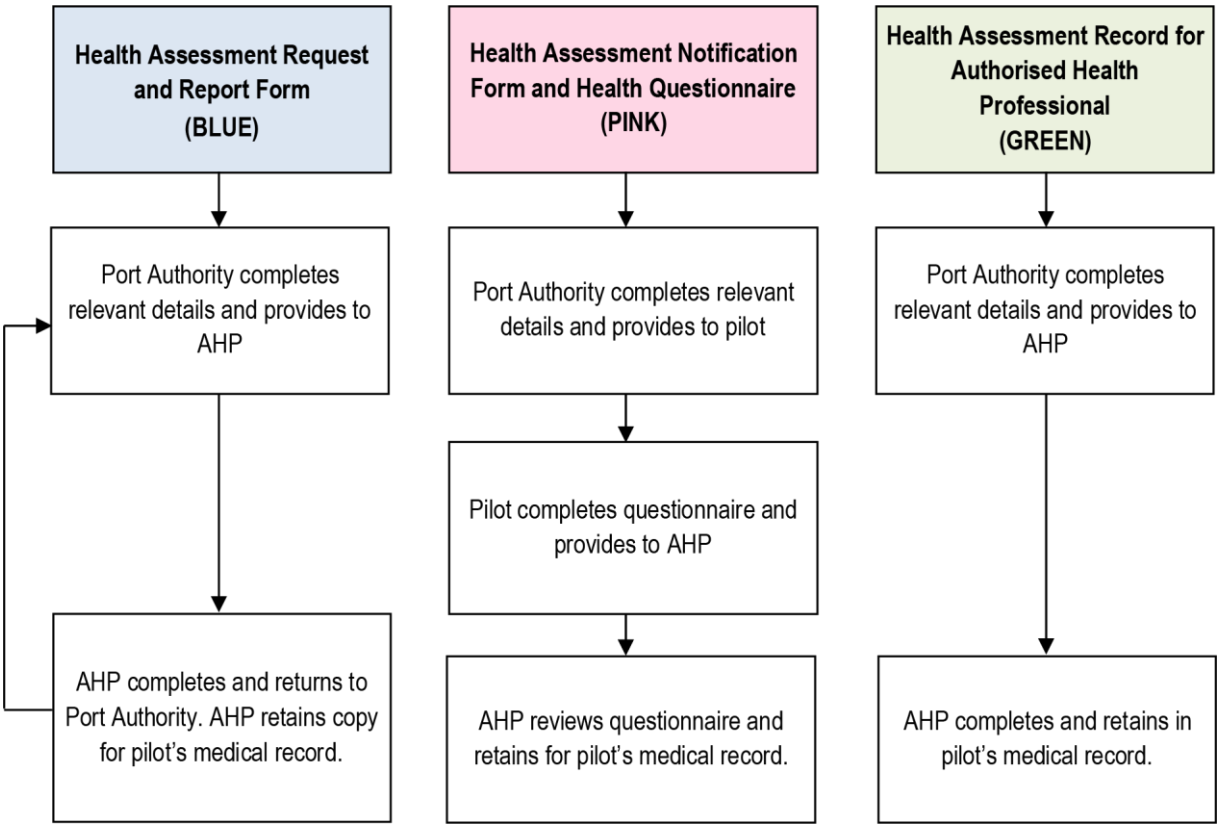
This form facilitates communication between the Port Authority and the Authorised Health Professional. The Port Authority completes relevant details regarding the pilot and the type of assessment requested. The Authorised Health Professional summarises fitness for duty assessment findings on the form and returns it to the Port Authority. Medical data is not conveyed, only functional capacity.

8.4.2 Health Assessment Notification and Health Questionnaire – Pink Form

This form notifies the pilot of the requirement to attend a health assessment. It includes:

- the reasons for the assessment;
- the instructions for the pilot; and
- the Health Questionnaire, which the marine pilot completes before attending the assessment appointment.

Figure 8 Use of health assessment forms



8.4.3 Health Assessment Record for Authorised Health Professionals – Green Form

This form guides the Authorised Health Professional through the assessment process and provides a standard clinical record. The Port Authority issues the form but, since it will contain details of the clinical findings, it is retained by the Authorised Health Professional rather than returned to the Port Authority.

8.5 Pilot identification

The Port Authority should establish systems to ensure proof of identity for the pilot for the purposes of the health assessments, including pathology testing.

This may include requirements for photo identification (ID). The systems may include a record of the currency of health assessment and review requirements.

8.6 Medical tests

The standard tests required for all Initial Licensing and Periodic Health Assessments are:

- audiometry;
- electrocardiogram (ECG); and
- blood test for cholesterol and HbA1c.

The Port Authority should ensure the tests are arranged in conjunction with the Authorised Health Professional so that results are available at the time of the assessment. Some tests may need to be conducted separately to the assessment with the Authorised Health Professional, i.e. through another provider.

Other tests will be conducted during the health assessment as outlined in the Standard, including the musculoskeletal assessment and vision assessment.

Additional tests may be ordered by the Authorised Health Professional based on findings of the initial assessment.

Test required for Triggered Health Assessments will be determined by the Authorised Health Professional on an individual basis.

8.7 Communication with pilots

The Port Authority should establish communication mechanisms to alert pilots of health assessment requirements, including alerts to management and pilots if systems are breached (e.g. if a health assessment is overdue).

8.7.1 Before the assessment

The pilot should receive adequate notice of the due date for their health assessment and the consequences of not presenting for the assessment in that timeframe. In line with privacy principles and the general requirements of the assessment, the notification should include advice on:

- the purpose of the assessment;
- who will conduct the assessment;
- who will receive the assessment report;
- the pilot's responsibility to provide accurate information; and
- the requirement to take photo ID to the appointment and to any tests.

Specific procedures should be developed by each Port Authority to explain general requirements for the health assessment. This should include:

- the requirement to take glasses, hearing aids or other aids to the appointment;
- the requirement to complete the Health Questionnaire prior to attending the appointment;
- the requirement to take current medication (or a list of it) to the health assessment appointment (including prescription, over the counter and alternative medicines);
- the requirement to take management plans for chronic conditions such as diabetes, mental health, etc to the appointment;
- the requirement to attend prescribed tests including, for Initial Licensing and Periodic assessments:
    - audiometry;
    - ECG; and
    - blood tests for cholesterol and HbA1c.

8.7.2 After the assessment

On receipt of the Health Assessment Report Form (Blue Form), where the pilot has been assessed as other than Fit for Duty, the Port Authority should discuss with the pilot any implications for their work and the policies or arrangements to be applied.

A record of such arrangements and actions required should be made on the form (Part C) and recorded on the database, together with the outcomes of the health assessment and any requirements for review assessments.

The pilot should have been provided with a copy of the assessment report by the Authorised Health Professional (refer to Section 8.8.3 After the assessment).

8.8 Communication with the Authorised Health Professional

8.8.1 Before the assessment

The Authorised Health Professional should not perform the health assessment without the appropriate forms consistent with those provided in Appendix 1.

The Port Authority should provide the Authorised Health Professional with the Request and Report form (Blue Form), the Record for Health Professional form (Green From) and supporting information relevant to the pilot's health assessment. The pilot takes the Notification and Health Questionnaire form (Pink Form) to the health assessment.

The examination should take place when the pathology results (i.e. blood test results) needed for the cardiac risk levels are available. If the results are not available, the pilot can be issued with a preliminary assessment of fitness or otherwise for duty, based on the clinical examination and other aspects of the assessment. The final assessment should be made as soon as possible, and the Authorised Health Professional should actively pursue the pathology results to ensure their timely completion. The Authorised Health Professional should contact the pilot to explain the results whether they are normal or abnormal.

8.8.2 Supporting information

For a Periodic Health Assessment, relevant supporting information should be made available to the Authorised Health Professional to support their awareness of relevant work and health related history. At a minimum, this includes the previous health assessment report (Blue Form).

Additional information may include any significant change in sick leave patterns or other information considered relevant to the assessment.

The Authorised Health Professional can request more information if required.

8.8.3 After the assessment

The Authorised Health Professional should contact the Port Authority immediately by phone and email if the pilot is Unfit for Duty but should not reveal details of the pilot's medical condition without the pilot's consent.

For privacy reasons, the Authorised Health Professional should not return the report form (Blue Form) to the Port Authority via fax, unless confidentiality can be assured.

The Port Authority should keep all documentation confidentially and securely in compliance with the *Health Records and Information Privacy Act 2002*.

9 Quality control

9.1 General requirements

The adoption of quality control systems is essential for the effective implementation of the health assessments for marine pilots. Quality control is important both for the conduct of the health assessments by the Authorised Health Professionals and for the management systems employed by the Port Authority. Quality control is therefore the responsibility of both Transport for NSW and the Port Authority.

Transport for NSW and the Port Authority should implement a system of formal quality control to ensure that:

- pilots are receiving health assessments in accordance with the requirements of this Standard;
- pilot health assessments are being administered and managed in accordance with the requirements of this Standard, both within the organisation and by Authorised Health Professionals; and
- privacy of health information is maintained.

9.2 Nature and extent of quality control system

This Standard does not identify specific requirements for the quality control system. Systems may include elements such as:

- internal or external audits — for example, audits of databases to ensure health assessments are being scheduled and completed as required;
- document reviews — for example, reviews of procedures and documentation to ensure consistency with this Standard; and
- consultation and feedback — for example, through discussions with Authorised Health Professionals and internal staff managing the processes and pilots.

Transport for NSW and the Port Authority should establish a risk-based system founded on consideration of factors such as:

- **The experience of the health professionals conducting the health assessments.** The system should involve all Authorised Health Professionals; however, the nature, extent and frequency of review or audit should take into account factors such as:
  - the turnover of Authorised Health Professionals; and
  - the relatively few assessments conducted by some practitioners.
- **The complexity of the organisation.** The Port Authority may risk 'creep' away from policies and procedures and should consider this risk when scheduling audits or reviews, and establishing the nature and extent of quality control measures.

The quality control system may change over time. Transport for NSW and the Port Authority should regularly review their requirements based on a risk management approach. The system should be devised and implemented by those with appropriate experience both of the maritime environment and this Standard.

To guide development of appropriate quality control systems, the following table describes possible points for audit or review of the health assessment systems of Transport for NSW and the Port Authority. These points provide an indication of the potential scope of quality control systems and are not exhaustive.

Table 4 Audit points for quality control of marine pilot health assessment

Table 4 Audit points for quality control of marine pilot health assessment

1. Authorisation of Authorised Health Professionals (Transport for NSW)

With respect to the authorisation and management of health professionals, Transport for NSW should adopt audit or review processes that:

- confirm up-to-date records are maintained of health professionals who are authorised by Transport for NSW;
- confirm that all health professionals who have conducted assessments are appropriately authorised by Transport for NSW; and
- confirm that all Authorised Health Professionals have received initial training and maintain currency, including receiving relevant update information from Transport for NSW.

2. Performance and outcomes of health assessments by Authorised Health Professionals (Transport for NSW)

With respect to health assessments performed by Authorised Health Professionals, Transport for NSW should adopt audit or review processes that:

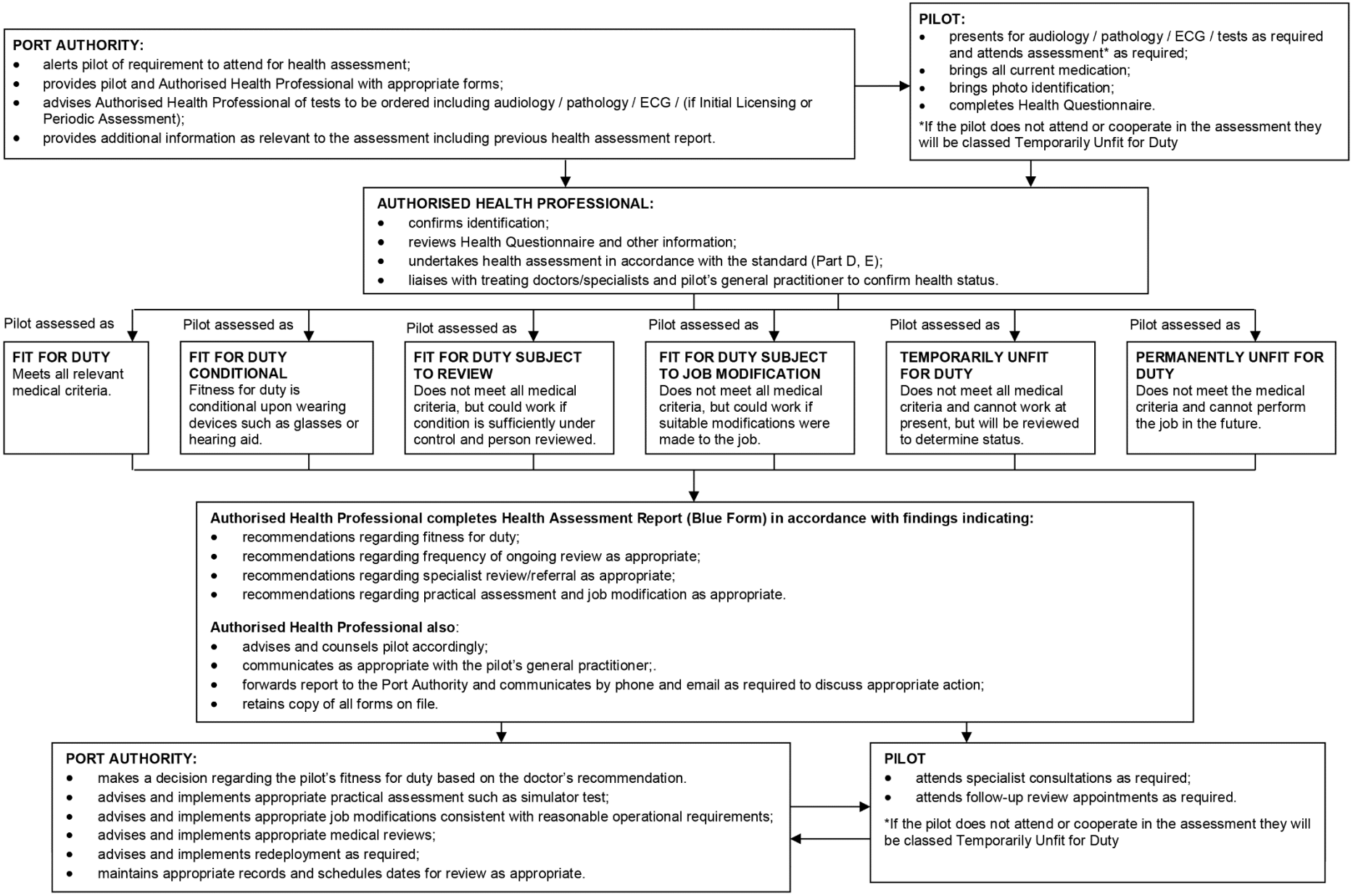
- confirm the Authorised Health Professional maintains suitable systems and procedures for managing and conducting health assessments, including the use of the appropriate forms;
- confirm the timeliness of various aspects of health assessments from initial assessment to reporting and follow-up as required;
- confirm the continuity of assessment from a medical viewpoint, including the number of different Authorised Health Professionals involved;
- confirm the consistency of the health assessments with the requirements of the Standard;
- confirm the appropriateness of medical decision-making in terms of fitness for duty;
- confirm the appropriateness of interaction with the Port Authority; and
- confirm the appropriateness of interaction with the marine pilot.

3. Management of the health assessment process (Port Authority)

With respect to management of the health assessment process, the Port Authority should consider adopting audit or review processes that:

- confirm there are adequate internal procedures in place that are in line with this Standard;
- confirm marine pilots hold current medical certification and that they attend health assessments as requested;
- confirm recall and monitoring systems adequately identify when health assessments are due, and adequately monitor assessment status;
- confirm the timeliness of reporting by Authorised Health Professionals;
- confirm the recall and monitoring system are effective in managing marine pilots with temporary medical certificates (requiring follow-up investigation) and those found Temporarily Unfit for Duty;
- confirm the appropriateness of interaction between the Authorised Health Professional and the Port Authority (e.g. compliance with privacy requirements).

Figure 9 Conducting a marine pilot health assessment for fitness for duty / licensing



PART C – THE INHERENT REQUIREMENTS OF PILOTAGE

10 Introduction

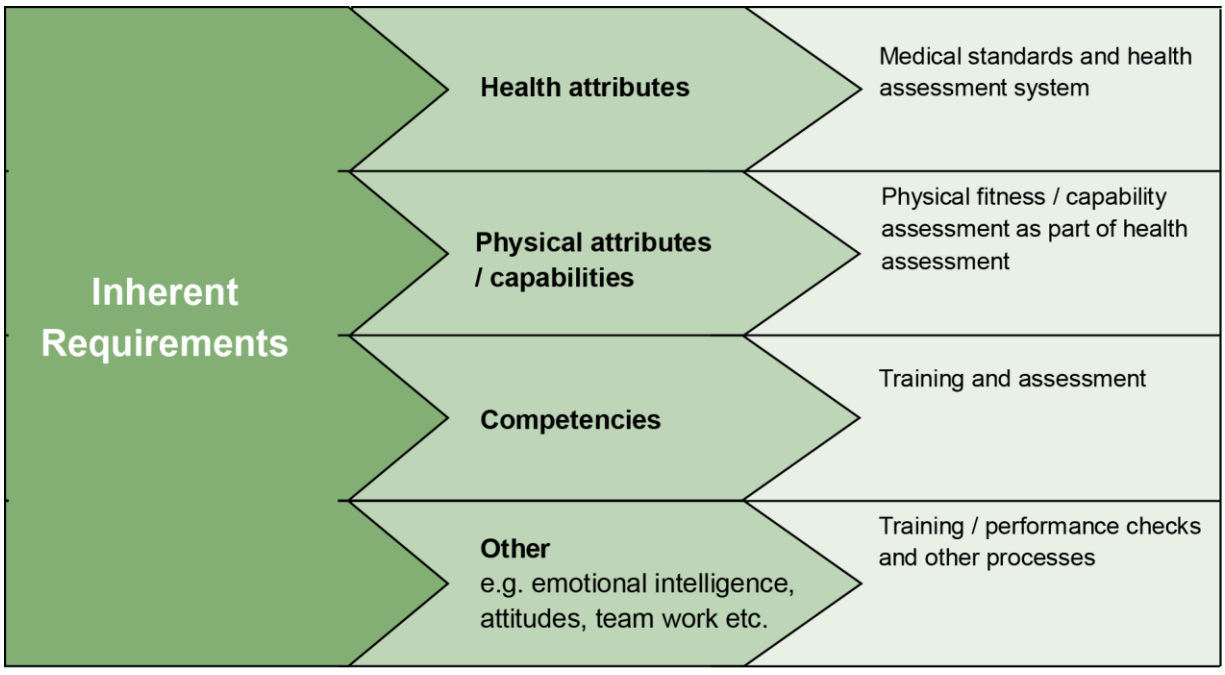
Determination of the inherent requirements of a pilot's job is fundamental to a risk management approach to pilot health.

For the purpose of this Standard, the inherent requirements of pilotage are ***the core duties that must be carried out in order to fulfil the purpose of the position***.[10] This definition encompasses the broad requirements of the job, not just those related to health (refer to Figure 10). This section of the Standard sets out 'generic' inherent requirements of marine pilot tasks and the risks associated with failure to complete these tasks, based on a review across New South Wales ports. It also identifies the health attributes (such as senses, psychological, musculoskeletal and cardiovascular capacities) needed to fulfill these inherent requirements. This in turn provides the basis for applying the medical criteria, which are set out in Part E of this Standard.

The Port Authority should conduct a risk assessment and address any local risks identified such as changes in the cargoes and dimensions of ships, peculiarities of the harbor, etc.

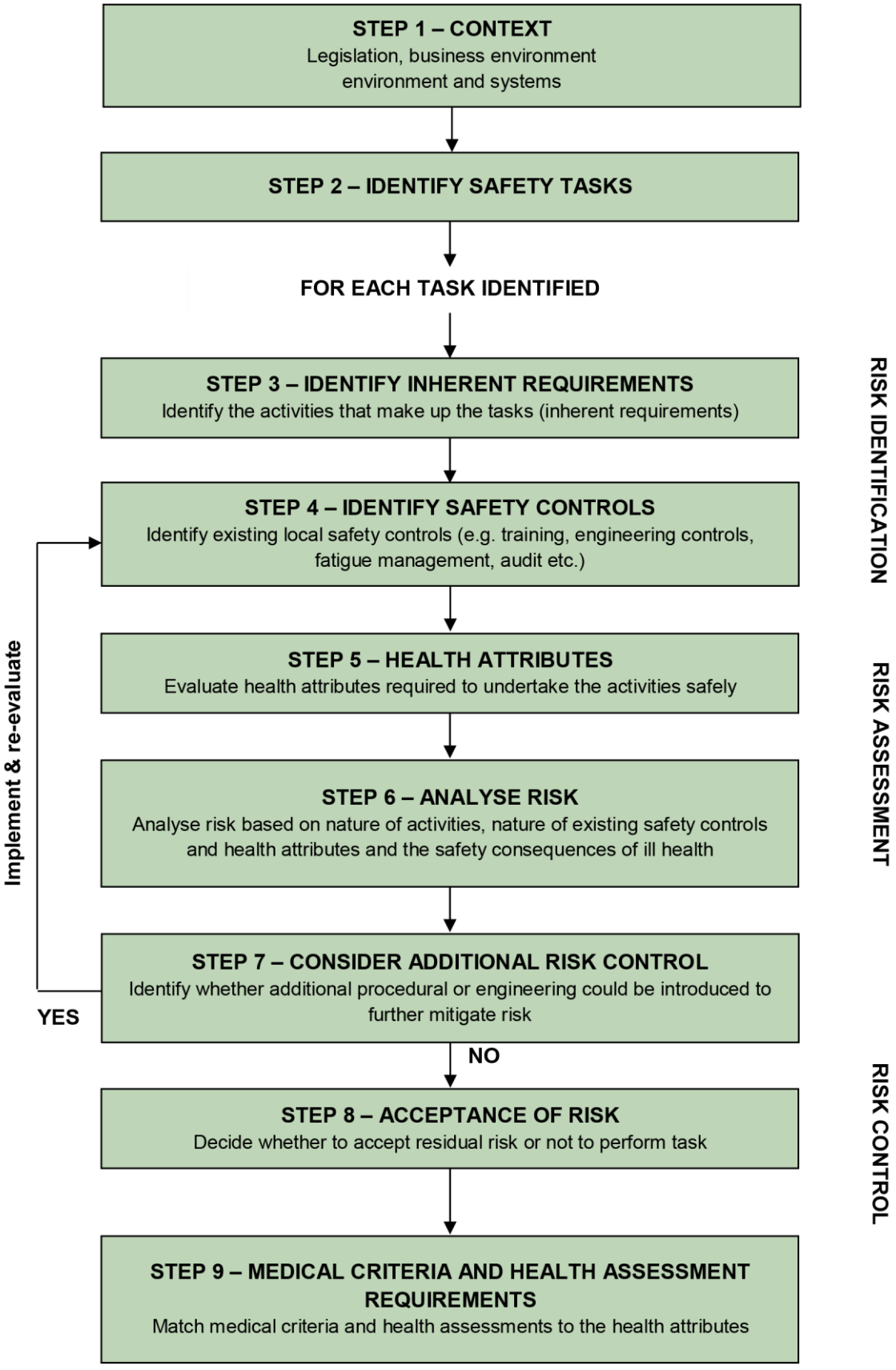
An understanding of the inherent requirements also helps to identify those attributes that cannot be readily assessed through a health assessment (e.g. cognitive capacities) and for which other assessment tools may be required.

Figure 10 Inherent requirements as a basis for health standards and pilot competencies



[10] Australasian Human Rights Commission. https://www.humanrights.gov.au/quick-guide/12052

Figure 11 Risk management of marine pilots [11]



[11] National Transport Commission. National Standard for Health Assessment for Rail Safety Workers, 2017

11 The context of pilotage work

11.1 Risk exposures

The pilot's role is to provide advice to a ship's master regarding safe passage of a ship through pilotage waters. The potential consequences of failures in marine pilot operations are considerable and may include:

- ship grounding;
- collision with the shore;
- collision with another vessel;
- inappropriate letting-go of anchors, or
- capsizing or damaging a tug.

In turn, such incidents have the potential to result in:

- serious injury and loss of life;
- environmental damage;
- property and infrastructure damage;
- commercial damage to port and trade;
- disruption of transport; and
- damage to reputation.

These are very considerable risks. There are critical phases during pilotage when it is likely the Master would not be capable of maintaining the safety of the ship without the expertise of the pilot. Health effects may also result in poor decision making which may not be obvious to the bridge team. Thus the work of a pilot should be regarded as 'safety critical work'.

11.2 Risk controls

Port safety is managed through the Port Safety Operating Licence (PSOL), which closely aligns with the Australian Port Marine Safety Management Guidelines[12] and requires the Port Authority to have licensed and fit pilots as per the NSW Marine Pilotage Code.

Particular aspects of safety management systems, or equivalent procedures, interface closely with the Health Assessment Standard.

11.2.1 Selection, training and quality control

Selection and training procedures reflect the high skill requirements of the pilotage task and are detailed in Volume 1 of the NSW Marine Pilotage Code.[13]

Marine pilots are currently selected from experienced mariners with appropriate qualifications. As such they have a wide experience of ships, navigation, personnel management and dealing with unforeseen circumstances.

[12] Ports Australia. Australian Port Marine Safety Management Guidelines, 2015.
[13] New South Wales Pilotage Code, Volume 1, October 2015

Pilots undergo extensive training and examination as required by legislation. They train under supervision of senior pilots prior to licensing and progress through licence levels under supervision. In addition, a program of quality control is in place which includes an annual audit of each pilot's performance by a senior pilot.

The ability to cope under stress may be assessed at the model pilot training centre or on a simulator.

11.2.2 Bridge Resource Management

Bridge Resource Management (BRM) is the effective management and utilisation of all resources, human and technical, available to the bridge team, to ensure the safe completion of the vessel's voyage. BRM is a key system for ensuring personnel and vessel safety. It has been introduced throughout Australia, and by many other trading nations, as a method to improve communication, challenge and response, and working with bridge team members, particularly cross-cultural working between pilots and captains and officers of ships.

11.2.3 Other

Fatigue management, equipment safety and emergency procedures are also relevant and mentioned in the Standard where relevant.

12 The inherent requirements of pilotage

Pilotage is a highly complex task, which involves rapidly integrating extensive knowledge of a diverse range of ships and navigation in a variable environment. It may also involve considerable physical exertion for embarking and disembarking ships. This job is conducted in an internationally dynamic work environment of changes in ships and cargoes as well as extremes in weather conditions due to climate change.

In general terms, the pilot's work may be considered in two main areas of activity, psychological and physical:

- **Psychological tasks (Pilotage)**

There are three main psychological aspects of the pilotage task.

  - Tasks requiring cognitive skills. Before boarding a vessel to pilot it in or out of port, the marine pilot is required to plan the course of the vessel taking into account tides, weather, dimensions, draft and operational characteristics of the vessel, and if there is a need for one or more tugs. Once on the bridge the marine pilot then has responsibility for navigating the vessel safely in and out of the harbour.
  - Tasks requiring communication skills such as effective teamwork, cultural awareness, interpersonal relationships and clear and easily understandable commands.
  - Tasks requiring the ability to respond effectively to emergency situations.

- **Physical tasks (Embarking/ Disembarking)**

Marine pilots are required to board and disembark from ships from the deck of small high-powered launches often in rough seas. This involves climbing/descending high ladders to access vessels. Alternatively, in some ports marine pilots access vessels via helicopters landing on the vessel or sometimes winching down onto the deck. These activities are described in more detail in Table 5.

13 Health attributes required for pilots' work

For each of the tasks described, various health attributes are needed (Table 6):

- information is gained about the environment through the senses (mainly vision and hearing);
- information is then processed by the brain (cognition or 'situational awareness') so decisions are made;
- decisions are put into effect by the musculoskeletal system and communication mechanisms;
- these actions alter the operation of the system;
- the cycle rapidly repeats and is multi-channelled.

These health attributes highlight the unusual mixture of high-level physical and mental capacities required for pilotage.

The necessary health attributes are described under four main categories although there is some overlap between them.

- ***Senses.*** These include vision, balance and hearing (and speech).
- ***Psychological.*** This includes cognition (situational awareness, good judgement, decision making), communication and the ability to respond appropriately in emergency situations. These attributes may be impaired for example by psychiatric conditions, neurological disorders and substance misuse as well as sleep disorders or hypoglycaemia associated with diabetes.
- ***Musculoskeletal capacity.*** This refers to the locomotor capacities of limbs and back, coordination of movement, stamina and agility.
- ***General health.*** These attributes refer to general stamina and (absence of) conditions which may cause collapse, including cardiovascular disorders, epilepsy, hypoglycaemic coma, etc.

Table 5 Inherent requirements

Table 5 Inherent requirements
A. PILOTAGE

Overview of requirements and environment

Pilotage is a highly complex task which involves rapidly integrating extensive knowledge of a diverse range of ships and navigation in a highly variable environment. This requires considerable concentration, judgement, forethought and stamina.

In most ports, pilots work rosters to enable provision of services 24 hours, seven days a week. Shipping movements can be changed at short notice which leads to unpredictability in work and sleep times.

Wind, ship movement, heat, cold and rain can all affect not only the boarding or disembarkation of pilots but also the pilotage task itself. Climate change is contributing to extremes of weather. There may be prolonged exposure to increasingly hot days on open wings when berthing.

Planning and trip preparation

At the outset of each pilotage task the details of the ship (draft, dimensions, type of cargo, propulsion arrangements etc.) and berth/destination are provided to the pilot so that the route to be navigated may be planned. Resources such as available tugs and other shipping movements are made known to the pilot. Winds and tides and events such as sailing regattas are noted.

Bridge resource management begins on arrival at the bridge when the proposed route and berthing plan, including the arrangement of tugs is discussed with the captain. The manoeuvring characteristics of the ship are also discussed at this briefing.

Bridge resource management. The pilot is discussing the proposed route with the captain. Communication is an important task.

Table 5	Inherent requirements

A. PILOTAGE

Navigating and ship manoeuvring

Navigation proceeds under the control of the pilot to control a vessel along a defined route into or out of port.

Using aids to navigation [including PPU – see below] and detailed knowledge of the port, the pilot continually uses a high level of judgement for giving advice on commencing turning and slowing of engines, depending on the mass and length of ship, steering characteristics, wind and tide conditions. In many situations, there is little room for error.

The Portable Pilotage Unit [PPU] integrates GPS and navigation software programs to assist the pilot in determining the position of the ship with great accuracy. These programs can also display predicted movement of the vessel, rate of turn and safety margins. The PPU are particularly helpful during very fine manoeuvring while closing to the berth position. This instant feedback of useful data is reassuring in all weather's and visibility and helps reduce stress, but does not obviate the need for high level cognition.

The services of tugs to push or pull are integrated into manoeuvring the ship by the pilot using a hand held radio. When berthing, the services of line boats and linemen are also integrated (by radio) for the 'controlled collision' of vessel and wharf. The pilot's aim is to berth but avoid damage to the ship and port facilities or injury to linemen. The pilot may be required to walk from wing to wing of the bridge (quickly in an emergency) to observe clearances.

Berthing is a 'controlled collision' between vessel and wharf. Line boat and linemen near stern.

Screen from PPU showing position of ship and predicted movement over the next five minutes in relation to navigation markers. The screen also displays key data such as helm and speed of the ship.

Tug manoeuvring the ship under radio-control from pilot.

Linesmen casting off under radio-control of pilot.

Table 5	Inherent requirements

A. PILOTAGE

Navigating and ship manoeuvring (cont)

The pilot continually scans ahead for navigation aids and other vessels. The aids are often coloured red or green and sometimes other colours; coloured lights need to be recognised at night. Navigation aids may be on land or buoys of various shapes according to maritime standards. Visibility may be reduced in rain or poor light at dawn or from the glare of port lights at night, etc.

On the bridge large dial type-instruments such as for compass bearings and speed are read at a distance of 1-5+m. The pilot checks these instruments as well as PPU to confirm his or her directions are being correctly implemented by the crew (particularly if there are language barriers).

At night time the demands on visual function are high. The bridge is darkened with instruments softly back-lit and non-navigation ships lights are dimmed This permits maximum dilation of the pupils of the pilot (and crew) to provide optimum 'night vision' for navigation such as for detecting channel lights or other ships. In contrast, when berthing at a wharf, such as a container wharf which has extensive flood lighting, there may be brilliant illumination of the wings of the bridge where the pilot is standing which causes constriction of the pilot's pupils. Rapid accommodation by the eyes may be required to change between such contrasting light perspectives.

In the daytime, sunlight can cause glare, which reduces vision, and the ultraviolet component can contribute to certain types of cataract formation.

Bridge showing pilot scanning ahead and radar screens and instruments (above the pilot's head) which may need to be read. The master and helm, who are integral to Bridge Resource Management, are also shown.

Navigation aids. Large orange coloured navigation aids in Newcastle Harbour.

Table 5	Inherent requirements
A. PILOTAGE	

Communication

All orders (whether spoken directly or via radio) are given using 'closed loop communication' whereby an order is repeated back to the pilot confirming that the essence of the order is understood. For example, orders to the helmsman or to the engine room. The noise levels on the bridge are moderate and ordinary conversation is possible.

When manoeuvring the ship from an open bridge wing, wind and rain can interfere with communication and a sheltered place needs to be found. Radio contact is made on an open channel with harbour control and tugs sharing information.

Radar and Automated Information Systems (AIS) are other forms of communication that assist with collision avoidance and vessel identification. The pilot has to communicate effectively with bridge teams, tug masters and linesmen who may be from different nationalities and cultures.

Pilot using radio-communication on an open channel to ensure good communication between all parties.

Emergency situations

Emergency situations can arise from numerous causes including equipment failures such as loss of engine power, steering failure, tug line breaking, radio communication failure or high gusty winds. These situations require instant knowledge of the pilotage waters at the time in relation to the characteristics of the ship.

The pilot continually scans ahead for hazards including vessels, the movements of some of which could be unpredictable. The pilot uses a detailed knowledge of the collision avoidance rules which are complex and are part of the pilot's knowledge base. Expert judgement is required about sounding the ship's siren, using radio communication or making avoidance manoeuvres.

Yacht dead ahead. The pilot must make a rapid judgment regarding safety.

Table 5	Inherent requirements

B. EMBARKING AND DISEMBARKING

Overview of requirements and environment

Boarding arrangements at sea vary between ports, with the majority occurring via pilot cutter while the ship is in motion.

This makes the task of embarking and disembarking ships at sea hazardous and demanding. It requires getting onto/off a ladder from/onto a cutter, climbing a long vertical ladder, sometimes in adverse weather with the ship and cutter rolling at different rates, and at night with reduced visibility. The pilot is not roped to a safety harness.

The task may be performed up to 4 times in a 10-hour shift, depending on the port and duration of pilotage. Sometimes the 9m long ladder leads to a lowered accommodation ladder, which the pilot also climbs in order to board the vessel.

In addition some ships do not have lifts and the equivalent of up to seven storeys of steep stairs may need to be climbed to the bridge.

Alternative boarding arrangements via helicopter are outlined on page 56.

Pilots have to undertake training and comply with port procedures in using pilot ladders. These cover checking the integrity of the ladder, its positioning in relation to the accommodation ladder, the positioning of the cutter, procedures for embarking and disembarking vessels, the role of the crewman. The interacting roles of pilot and cutter crew are specified.

9m pilot ladder being positioned near an accommodation ladder.

Table 5	Inherent requirements
B. EMBARKING AND DISEMBARKING	

The pilot cutter and crew

A pilot cutter is specifically designed for the job with handrails and a non-slip deck.

A secured deck hand has a critical role in assisting the pilot onto and off the ladder. He assists the pilot ascend by holding ropes and lifting the pilot up to clear the cutter, and on descent uses his arms to hold the pilot secure when boarding. The deckhand and pilot communicate by voice (shout) or in noisy conditions (i.e. bad weather) use hand signals.

The cutter master has to continually manoeuvre the cutter to be against the ship and position the pilot and deck hand in relation to the ladder. If this is not done properly the pilot can fall, or be crushed, between cutter and ship.

Pilot cutter showing handrails, open non-slip surface and marked area for ladder work.

Ladder climbing technique

The technique of ladder ascending and descending varies greatly between pilots. The man-ropes are often used to gain a foothold. Some pilots use these for the entire ascent or descent but others use the side ropes on the ladder.

Critical judgement is needed in a rough sea regarding timing for gaining/leaving the ladder from/to the cutter. There is potential for the pilot's leg to be jammed between the cutter and the ship, for the pilot to land violently on the deck or fall overboard. Ladder climbing is the major cause of injuries to pilots.

Pilots ladder showing use of man-ropes (on land).

Pilots ladder showing use of side-ropes on ladder (on land). (The man-ropes are being held to one side for illustration purposes.)

Table 5	Inherent requirements
B. EMBARKING AND DISEMBARKING	

Ladders*

Ladders are designed according to Regulation 17 of the *International Convention for the Safety of Life at Sea, 1974* and Australian Standard 2933 *Ship Building - Pilot Ladders* (1987, reproduced from ISO 799). The steps are spaced 30-38cm apart and are 40cm wide and 11.5cm deep. The doubled side ropes of the ladder have a diameter of 20mm each and the man-ropes are 28mm in diameter.

Ropes must be in good condition and strong enough to hold great weights. However, the quality of ladders and associated rigging varies greatly. If the ladder fails, the pilot may need to hold onto the man-ropes until able to gain the cutter.

A major risk in the pilot's work is falling into the sea at the time of boarding or leaving the cutter or from the collapse of a ladder.

For this reason pilots wear lifejackets to remain afloat. In addition the cutter crew has extensive training in 'man overboard' rescue practices. The cutter master and crew move to emergency controls in the stern; a platform is lowered into the water; and a crewmember retrieves the pilot using a boat hook.

The temperature of the water as well as injuries sustained in the fall will influence survival of the pilot. However, apart from general cardiovascular fitness there are no specific health attributes of the pilot which will contribute to survival.

Rescue procedures are detailed in a Pilot Safety Management System 'Man overboard' 17.3 or in pilotage procedure manual.

Pilot on ladder using man-ropes reaching accommodation ladder. Cutter below with crew man holding man-rope.

Man overboard training by cutter crew showing a dummy pilot being bought on board at stern.

*Note: The ergonomics and risks of use of ladders have been the subject of a report 'A risk assessment of pilot ladder transfers', by Fiona Weigall and Katrina Simpson, (Health and Safety Matters Pty Ltd, 2005). This report should be referred to for information regarding improved ladder design, safety clothing and work organisation, which are beyond the terms of reference of this document. The report is the property of Sydney Ports Corporation.
A further report by Daniel O'Neill, Ethos Health (2013) described the musculoskeletal tasks and risks

Table 5	Inherent requirements
B. EMBARKING AND DISEMBARKING	

Boarding via helicopter

In Newcastle, helicopters are extensively used to ferry pilots to and from ships. This is partly due to the high number of coal carrying and similar types of ships, which can accommodate a helicopter landing site.

Helicopters eliminate the need to climb the pilot's ladder and the risks associated with this, although some ships' helipads have poor access from the deck and require pulling or jumping up onto it. Also there is still a need to climb 6 - 7 flights of stairs to the bridge. Occasionally pilots are winched onto or off ships where there are no suitable landing areas for helicopters.

One risk to health associated with helicopters is noise, which can induce hearing loss, which in turn may affect communication in pilotage. (This risk should be managed as per state WHS regulations.)

Another risk associated with flying in helicopters is crashing into the sea. Because of this, maritime pilots undergo Helicopter Underwater Escape Training [HUET] involving simulated underwater escape.

However, some ships visiting the Port of Newcastle require access via the conventional pilot ladder and cutter. Poor weather when helicopters are unable to fly also necessitates the use of pilot ladder and cutter to board/disembark all ships.

Therefore, while Newcastle marine pilots often use helicopters, the need to climb ladders remains an inherent requirement of their work.

Helicopter landing on a helicopter pad on a ship. Short ladder to access pad shown in foreground.

Marine pilot standing by helicopter wearing helmet with built in hearing protection.

Table 6 Health attributes

Table 6 Health attributes	
PILOTAGE	**EMBARKING AND DISEMBARKING**
The following health attributes are important to the task of pilotage: **Senses** ***Vision*** There are high visual demands within the bridge and particularly externally. The need to read charts and instruments such as PPU requires near and intermediate visual acuity. The need to continually survey the external environment under conditions of varying visibility for navigation aids and unpredictable events requires far visual acuity, full visual fields and colour vision. The demand on colour vision is greatest at night as isolated red or green points of light need to be recognised to determine the course of a craft; unlike traffic lights there is no redundancy of information from positional cues. When it is necessary to repeatedly look into the dark and then bright light (as when berthing) rapid accommodation by the eyes is required. Sunlight can cause glare, which reduces vision, and the ultraviolet component can contribute to certain types of cataract formation, thus eye protection is necessary. ***Hearing (and speech)*** Hearing and clarity of speech is important for communication on the bridge and on the ladder. On the bridge the use of 'closed loop communication' is an important safety feature for both local conversation and radio communication. If a pilot does not hear someone speak correctly, then on repeating it back to the sender the error is likely to be identified. The background noise on bridges varies but generally is low enough for conversation with the helmsman and captain. Radios have the ability to adjust sound levels in bad conditions but are difficult to use in the wind. The pilot needs to be able to process audiological input from several sources including radio and voice at the same time.	The health attributes required to safely embark or disembark the ship are quite different from pilotage. **Senses** ***Vision*** On the ladder, the pilot requires sufficient vision to see steps and ropes and general position with regard to the ship and the cutter or helicopter. ***Hearing*** On descending the ladder to the cutter, the ability to communicate with the deck hand is important. A system of hand signals is used in situations where noise precludes voice communication. ***Balance*** When embarking and disembarking the ship by the pilot ladder, there is a high demand on sense of balance. This is particularly so in bad weather with the ship rolling and the cutter tossing. An intact sense of balance is critical.

Table 6 Health attributes	
PILOTAGE	**EMBARKING AND DISEMBARKING**
Psychological Capacity Pilotage places a high demand on cognition including continual attentiveness, situational awareness, memory and decision-making when on the bridge. Bridge resource management also requires good communication skills and the ability to respond effectively to emergency situations. These attributes may be impaired by: • psychiatric conditions such as anxiety or depression; • neurological conditions such as after a stroke or head injury or Alzheimer's disease; • sleep disorders such as obstructive sleep apnoea. (It is noted that the Port Authority will have in place a system of fatigue management and the medical assessment of sleep disorders should be seen as integral to this); • substance misuse • hypoglycaemia associated with diabetes.	**Psychological/Cognitive Capacity** On the ladder there is considerable need for situational awareness; acute judgement is required when moving to or from the cutter. A similar range of conditions to those affecting working on the bridge (psychiatric, neurological, substance misuse and sleep disorders) may impair this judgement. There is a need to be able to work at heights and in exposed conditions on the ladder. (This attribute is not easily assessed medically and the employment history gives a better guide).
Musculoskeletal Capacity Once on the bridge, the musculoskeletal demands are modest. The pilot is mainly walking about the bridge but requires stability of legs on a rolling ship. In an emergency the pilot may be required to move rapidly from wing to wing.	**Musculoskeletal Capacity** When embarking or disembarking using the ladder, there is a very high demand on musculoskeletal health attributes. Ladder climbing requires a full range of movement and good power of neck, back, arms (including hand grip) and legs. Gaining the ladder from the cutter, in particular requires good upper body strength. This is particularly so in conditions of bad weather. Associated with these requirements is the need for maintenance of appropriate body mass index (BMI).
General health On the bridge, in addition to cognitive performance, avoidance of collapse is important. Various medical conditions may cause collapse including: • cardiovascular conditions such as ischaemic heart disease or arrhythmias; • epilepsy; • hypoglycaemic coma associated with diabetes; and • stroke.	**General health** As on the bridge, avoidance of collapse on the ladder is crucial. Various medical conditions may cause collapse including: • cardiovascular conditions such as ischaemic heart disease or arrhythmias; • epilepsy; • hypoglycaemic coma associated with diabetes; and • stroke.

Table 6 Health attributes	
PILOTAGE	**EMBARKING AND DISEMBARKING**
	On the ladder the pilot also needs to have considerable cardiovascular and respiratory capacity for climbing 9m vertically (and often additional flights of stairs when on board). Various medical conditions may impair this necessary health attribute including: • cardiovascular disease including ischaemic heart disease or arrhythmias; • respiratory disease such as advanced chronic obstructive lung disease or severe asthma; and • anaemia.

References

Daniel O'Neil, Ethos Health (2013), Marine Pilot Role Report for Newcastle Port Corporation.

Fiona Weigall, Katrina Simpson, Health and Safety Matters Pty Ltd, 2005. A risk assessment of pilot ladder transfers.

PART D – PROCEDURES FOR CONDUCTING HEALTH ASSESSMENTS

This section is for the guidance of Authorised Health Professionals conducting the health assessments for marine pilots. It provides an overview of the health assessment procedures and the specific medical tests. Details of the tests and their interpretation for fitness for duty are included in the relevant chapters in Part D of the Standard.

14 Health assessment procedures for Authorised Health Professionals

The administrative, clinical and reporting procedures which should be followed by the Authorised Health Professional in conducting health assessments for marine pilots are described below. Further detail in relation to the conduct of the specific aspects of the clinical assessment and the interpretation of test results is included in the chapters following this section of the Standard.

14.1 Appointments

An appointment for an assessment will be made either by the Port Authority or the pilot.

Prior to the appointment, the Port Authority will forward to the Authorised Health Professional and the pilot the relevant forms and documentation. The health professional should not conduct the assessment without the appropriate forms (refer to Section 8.4 Health assessment forms).

14.2 Forms and supporting information

Forms are included in Appendix 1 of the Standard and include:

- ***Health Assessment Request and Report Form (BLUE Form),*** which will indicate the type of health assessment required (e.g. Initial Licensing, Periodic or Triggered);
- ***Health Assessment Notification and Health Questionnaire (PINK Form),*** which the pilot should have completed and brought to the appointment; and
- ***Health Assessment Record for Authorised Health Professional (GREEN Form),*** which guides the clinical examination and provides a standardised template for recording a general assessment of fitness for duty.

The Port Authority will also send relevant supporting documentation to the Authorised Health Professional. At a minimum, this should include a copy of the report from the previous health assessment (Blue Form). Additional information such as a summary of sick leave and workplace injuries may also be included if relevant to the assessment. The Authorised Health Professional may seek further information from the Port Authority if required to undertake the assessment.

14.3 Tests required prior to attending assessment

Marine pilots are required to have a number of tests before attending an assessment. For an Initial Licensing or Periodic Health Assessment these tests include:

- audiometry; and
- an electrocardiogram (ECG); and
- fasting blood tests for cholesterol (total and HDL)
- blood test for HbA1c (fasting not required but will take place at the same time as cholesterol).

These should be completed in advance so that the results are available at the health assessment. The marine pilot will also be asked by the Port Authority to bring all medications or a list of their medications to the appointment, as well as copies of management plans, such as for diabetes or other conditions.

There are no specific tests prescribed for a Triggered Health Assessment. Any tests will be determined by the Authorised Health Professional.

14.4 Facilities and equipment

The examination room should be well lit, quiet and offer privacy. Equipment should include:

- Snellen chart and Times-Roman chart (40cm and 100cm) for visual acuity tests;
- Ishihara plates (24 plate edition) for colour vision test;
- equipment for step test (or refer for VO_2 max test);
- Jamar hydraulic handgrip dynamometer (or equivalent)
- equipment for ropes test, which comprises two 'man ropes' (28mm in diameter) secured from the ceiling and spaced 50cm apart, and a set of scales;
- sphygmomanometer;
- scales and height measure and table to calculate BMI; and
- lap top/PC for recording data and calculating risk score.

14.5 Orienting the pilot

To orient and inform the pilot about the health assessment procedure:

- explain the purpose and process of the health assessment, and that the results will be discussed with them;
- confirm their identity; and
- explain Privacy Principles: that all clinical and health information will remain confidential and will not be forwarded to the Port Authority without the pilot's consent. The report (Blue Form) provided to the Port Authority will be in functional terms in relation to the pilot's fitness for duty, as indicated on the form. However in the event of an abnormality being found, it is helpful if the pilot will consent to appropriate information being made known so that a plan of management can be developed. The Authorised Health Professional should ask the pilot to sign the front page of the 'Pink Form' stating that they have understood the privacy principles.

14.6 Health questionnaire

A marine pilot attending for an Initial Licensing or Periodic Health Assessment should bring a completed Health Questionnaire (Pink Form). The assessment should not proceed unless this has been completed.

The Authorised Health Professional should review the pilot's responses to the questionnaire and elicit further information as required. Comments should be noted as appropriate.

Scores should be calculated for various sections of the questionnaire and the results recorded on the *Health Assessment Record for Health Professional* (Green Form). These sections include:

- K10 questionnaire (Question 8);
- Epworth Sleepiness Scale (Question 6); and
- alcohol AUDIT questionnaire (Question 7).

The Authorised Health Professional should clarify and discuss aspects of the questionnaire as required.

The pilot should be asked to sign the questionnaire as a truthful statement. The Authorised Health Professional then countersigns and dates the completed questionnaire (last page of Pink Form).

14.7 Clinical assessment

When examining a pilot to assess their fitness for duty, the health attributes which are required to meet the inherent requirements should be considered (refer to Part C – Health attributes required for pilots' work). The functionality of various body systems should be addressed as outlined below. They are described in further detail in the medical criteria chapters (refer to Part E – Medical criteria).

Additional tests or referral to a specialist may be required if the clinical examination raises the possibility of potentially significant problems. It may be necessary to contact the treating doctor to clarify information regarding the pilot's health. This must be done with their consent.

The following guidance on conduct of the clinical examination is based around the four main health attributes: senses, general health and stamina, musculoskeletal capacities and psychological health / cognition.

14.7.1 Senses

The history should be complemented with the test results for hearing and vision.

14.7.2 Hearing

If facilities are available, the Authorised Health Professional may conduct audiometry according to procedures outlined in Section 19 Hearing. Alternatively, assessment by an audiologist should be arranged prior to the assessment.

14.7.3 Vision

Visual acuity

Visual acuity is tested with a Snellen chart that includes at least five letters on the 6/12 line, at a distance of 6m (or scaled to 3m). The Authorised Health Professional should explain the process to the pilot and ask them to read lines near the top to familiarise them with the chart.

Visual acuity should be measured one eye at a time (monocularly) without correction in the first place. More than two errors in reading the letters of any line is regarded as a failure to read that line. Correction may then be added to reassess the acuity.

Near vision should be assessed using the Times-Roman chart.

Colour vision

Colour vision is assessed using the Ishihara plates (12 screening plates of the 24 plate edition). More than 3 errors is a fail in which case further assessment is required.

Visual Fields

Visual fields may be initially screened by confrontation. Any person who has or is suspected of having a visual field defect should be referred for expert assessment by an optometrist or ophthalmologist.

14.7.4 General health (stamina and conditions that may cause collapse)

The history should be complemented with the physical examination and the results of the Cardiac Risk Score and maximal oxygen uptake (VO_2 max). Other conditions which may cause acute incapacity such as syncope will mainly be elicited from the history.

Cardiorespiratory examination

The cardiorespiratory examination should include:

- blood pressure - this may be taken sitting or supine. If blood pressure is ≥140/90 the pilot should be managed as per page 87;
- pulse rate;
- heart sounds;
- chest examination; and
- peripheral pulses.

Calculation of the Cardiac Risk Score is based on pilot's age and sex, whether they are a smoker, blood pressure, ECG results, fasting cholesterol (total and HDL), and HbA1c. The Australian absolute cardiovascular disease web-based calculator should be used to calculate risk so as to ensure uniformity http://www.cvdcheck.org.au/. Where the online calculator is not available, the tables in Section 17 Cardiovascular fitness and diseases may be used (https://www.heartfoundation.org.au/images/uploads/publications/aust-cardiovascular-risk-charts.pdf). For scoring, refer to Section 17 Cardiovascular Fitness and Diseases.

Cardio-respiratory fitness is assessed by measuring maximal oxygen uptake (VO_2 max). It may be indirectly measured using various tests. A step test is preferred as it is similar to climbing the ladder and stairs. Step tests include the Chester, Queens College and YMCA tests. The choice of test should give consideration to the anthropometry of the pilot. The resulting VO_2max value should be compared to normal values by age and sex (Figure 16). Direct VO_2 measurement is the definitive test.

The abdomen should also be examined but a genital or rectal examination is not routinely required unless there is an indication to do so based on the history.

14.7.5 Musculoskeletal capacity and body mass

The history should be complemented with various tests of physical strength and calculation of body mass.

A comprehensive musculoskeletal assessment, including assessment of strength, agility and coordination should be carried out including:

- identification of any scars, abnormalities or deformities which may prevent or limit marine pilot duties;
- assessment of neck rotation, flexion and extension;
- assessment of grip strength using a Jamar (or equivalent) grip test (refer to Figure 23). This test should be conducted before the ropes test to ensure safety in conducting the latter test. assessment of upper limb movement, grip strength and relative upper body strength to gross mass using a ropes test that assesses the pilot's ability to hold 60% of their body weight, (as when transferring to the ladder from the cutter). Refer detailed protocol in Section 20 Musculoskeletal conditions.
- assessment of back rotation, flexion and extension including the Bridge (hover) test;
- assessment of lower limb movement including ability to perform the step test for VO_2 submax.

Refer Section 20 Musculoskeletal conditions and the assessment form (Appendix 1) for further details of the musculoskeletal assessment. Refer also to Section 21 Neurological conditions for details relating to peripheral neurological function.

Body Mass Index (BMI) is relevant to the pilot's ability to gain access to and climb the pilot ladder safely. Some allowance should be made for body composition because very muscular persons may have a high BMI but will be fit and therefore at low risk when climbing the pilot ladder (refer to Figure 26). The ropes test described above also provides an indication of the pilot's capacity to manage themself safely on the ladder in relation to their body weight.

14.7.6 Balance

The assessment should involve observation of the pilot's gait and performance of a Romberg Test for balance (refer to Section 21.3 Balance and vestibular disorders).

14.7.7 Cognitive/psychological wellbeing

The examination aims to identify psychological, neurological or other conditions (such as excessive daytime sleepiness or hypoglycaemia or substance misuse) that may impact on the pilot's ability to undertake pilotage work, including:

- their cognitive capacity for situational awareness, navigation, pilotage and decision making tasks;
- their communication skills for effective teamwork, cultural awareness, interpersonal relationships, and clear and easily understandable communication; and
- their ability to respond effectively in emergency situations.

The history and the scores of specific questionnaires (K10, AUDIT) are the prime medical source of information regarding some psychological conditions or substance misuse that may affect cognition. Information provided by the Port Authority should also be considered.

Psychological health

Consider the result of the K10 questionnaire (Question 8 of the Health Questionnaire) together with other relevant self-reported history and clinical signs, as well as any accident/incident patterns reported by the Port Authority. For detailed guidance in interpreting the K10 score see Section 22 Psychiatric Disorders.

If the K10 score is raised (≥19) or other clinical observations warrant it, the findings should be discussed with the pilot to determine possible explanations such as work stress, domestic crises or endogenous causes. Where warranted, the mental state should be assessed as per Section 22 Psychiatric Disorders. See also Section 14.8 Additional tests and marine specific resources regarding practical assessments of competence.

Drug and alcohol dependence or impairment

The main purpose of the health assessment with respect to alcohol is to examine for harmful drinking patterns or alcohol dependence.

The Authorised Health Professional should consider the result of the AUDIT Questionnaire (Question 7 of the Health Questionnaire) together with relevant history, and/or clinical signs. Refer to Section 25 Substance misuse and dependence for guidance on managing the pilot in relation to the score.

If during an Initial Licensing or Periodic Health Assessment, the examining health professional identifies apparent acute alcohol impairment, this should be managed according to the specific chapter (refer to Section 25 Substance misuse and dependence).

Details of management of drug screening and interpretation of results is beyond the scope of this standard.

Drug screening may be required for Initial Licensing Health Assessments or for a specifically referred Triggered Health Assessment. Screening should be conducted in line with *Australian/New Zealand Standard 4308:2001: Procedures for the Collection, Detection and Quantification of Drugs of Abuse in Urine*.

Sleep

The Authorised Health Professional should consider the results of the Epworth Sleepiness Scale score (Question 6 of the Health Questionnaire) together with relevant history, clinical signs and work performance reports, such as reports of excessive daytime sleepiness.

The BMI is a useful objective screening tool for sleep apnoea. Risk should be categorised and managed as per the chapter on Section 24 Sleep Disorders).

14.8 Additional tests and marine specific resources

There are additional tests and marine specific resources that may assist with the assessment, for example training and performance assessment records. Cognitive capacity may be assessed under normal or stressful situations using computer simulation or scale model simulation of pilotage.

Land-based practice ladders are also available in Sydney and Newcastle for assessment of musculoskeletal capacity.

14.9 Specialist referral

The pilot's condition may warrant referral to a specialist. In such cases the Authorised Health Professional should explain fully to the specialist the nature of the piloting task and the concerns regarding health status of the pilot. The specialist report should be sent to the Authorised Health Professional for interpretation and reporting, not to the Port Authority. The person may need to be categorised Temporarily Unfit while health status is being resolved in which case the Port Authority should be promptly advised of the likely duration.

14.10 Informing and counselling the pilot

The Authorised Health Professional should advise the pilot of the results of the assessment and where relevant, about the ways in which their condition (e.g. BMI > 30) may impair their ability to perform their duties. As part of this process:

- the pilot becomes better informed about their health and fitness in general;
- the nature of any condition and the extent to which he or she can maintain control over it;
- the importance of regular medical review; and
- the need for medication or talking therapies where appropriate.

Should the pilot be found Temporarily or Permanently Unfit for Duty, the Authorised Health Professional should take a conciliatory and supportive role while explaining fully the risks posed by the pilot's condition with respect to marine piloting.

The Authorised Health Professional should be alert to and refer to interfacing programs as appropriate (refer to Part A - Introduction).

14.11 Reporting to the Port Authority

All pilots must be categorised regarding their fitness for duty. The possible classifications regarding fitness for duty are set out in Section 7 Standard reporting framework.

- Fit for Duty Unconditional
- Fit for Duty Conditional
- Fit for Duty Subject to Review
- Fit for Duty Subject to Job Modification
- Temporarily Unfit for Duty
- Permanently Unfit for Duty i.e. unfit for at least 12 months.

Should the pilot be assessed as Unfit for Duty either temporarily or permanently, the Authorised Health Professional should notify the Port Authority immediately by phone to discuss the implications of the assessment and to allow the Port Authority to make appropriate roster arrangements. The Authorised Health Professional should not discuss specific clinical information, only recommendations in terms of fitness for duty including any necessary job modifications.

In all cases the Authorised Health Professional should complete the health assessment report (Blue Form). This should not include any clinical information. Only the functional assessment of fitness for duty or otherwise, and any recommendations regarding specialist review or job modifications and the like should be reported to the Port Authority.

The Health Questionnaire (Pink Form) and Health Assessment Record (Green Form) should not be returned to the Port Authority.

If the examination cannot be completed satisfactorily the pilot should be categorised as Temporarily Unfit for Duty and the pilot and the Port Authority so advised.

14.12 Record keeping

Appropriate records should be maintained by the Authorised Health Professional including:

- completed Health Questionnaire (Pink Form);
- completed Health Assessment Record (Green Form);
- copies of test results;
- copy of the report form sent to the Port Authority (Blue Form);
- copies of relevant supporting information; and
- any additional clinical notes.

In addition and in accordance with legislation:

- the pilot's medical records should be made available to them on request;
- the pilot's medical records are subject to confidentiality; and
- records may be scanned and kept in electronic form. The pilot's signature on the completed Health Questionnaire is legally valid after scanning. This also applies to the health professional's signature.

Medical records may be subject to audit by a medical specialist appointed by Transport for NSW or the Port Authority. Audit will be for purposes of quality assurance and feedback to the Authorised Health Professional and will not disclose individual results (refer to Section 9 Quality control).

14.13 Communicating with the pilot's general practitioner and other health professionals (refer to Figure 4)

The Authorised Health Professional should ensure an ethical relationship with the pilot's general practitioner and other treating professionals, and should ensure continuity of care is maintained.

Reference to the general practitioner should be made for ongoing treatment requirements, for management of lifestyle issues and to discuss issues such as medication side effects.

The Authorised Health Professional should obtain the pilot's consent if needing to contact their general practitioner or treating specialist to clarify information relating to the pilot's health condition.

It is inappropriate for a pilot's general practitioner to be the Authorised Health Professional as there may be a conflict of interest.

PART E – MEDICAL CRITERIA

The detailed assessment processes, medical criteria and general management guidelines for health assessment of marine pilots are contained in the following chapters.

The medical criteria are arranged in chapters alphabetically according to body system or medical condition. Each chapter provides general information about the body system/condition and its effects on safety, and then provides advice about the assessment of the body system/condition. The table in each chapter sets out the criteria to be met for fitness for duty.

The main focus of the medical criteria is on serious conditions that would impact on the ability to perform piloting duties. The criteria emphasise function in relation to the job rather than being based on diagnosis or impairment. Specialist advice may be useful regarding assessment in some cases.

15 General considerations

15.1 Generic assessment

The medical criteria chapters provide detailed guidance regarding the majority of major medical conditions. However, it is not possible to cover the complete range of conditions that may need to be considered by an examining health professional.

A generic approach may be applied in situations where conditions or symptoms are encountered which are not covered in the Standard. This approach also applies to the situation where there are multiple minor conditions where concern may arise regarding their net effect on safety of the pilot and pilotage. This may occur, for example, in the setting of degenerative disease or multiple traumas after a motor car crash.

The basic principle in such assessments is to be mindful of the inherent requirements of pilotage and the associated necessary health attributes to meet the requirements. These matters are discussed in detail in Part C – Inherent requirements of marine pilots.

Clinical judgement is then required regarding assessing the severity of the condition in relation to the demands of performing the pilotage job safely. It is desirable that the examining doctor has first-hand understanding of the job requirements to make this assessment with insight. Where necessary, additional tests may be required or discussions with the pilot's treating doctors or others may be helpful.

The determination regarding fitness for duty should be conveyed to the Port Authority using the usual classifications such as 'Fit for Duty' (refer to Section 7 Standard reporting framework - Fitness for Duty categories).

When appropriate, it is helpful if the consent of the pilot can be gained to disclose the nature of the condition(s) to the Port Authority to facilitate a sensible plan of health management.

It is important that good clinical notes be kept for future reference. These should include:

- the symptoms and relevant clinical findings used for diagnosis;
- the assessment regarding fitness for duty with regard to the necessary health attributes;
- the determination and advice given to the pilot and the Port Authority; and
- whether consent of the pilot has been provided for contacting their treating doctor.

15.2 Undifferentiated illness and fatigue

A marine pilot who presents with symptoms that could have implications for their job, but the diagnosis is not clear, may be managed as follows. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made and before the pilot and the Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease which will affect the piloting task.

Generally, a marine pilot who presents with symptoms of a potentially serious nature, for example chest pains, blackouts, delusional states or dizzy spells, should be categorised Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be categorised as fit for alternative duties which are not safety critical.

Of particular relevance are the various non-specific symptoms of fatigue that may affect pilots. These include feeling tired, drained or exhausted, sometimes with an associated loss of alertness, poor judgement and irritability; (sleepiness may not be a feature). Fatigue may arise in conjunction with the demands of irregular rosters or for other reasons. Pilots often have records of their rosters which may help in diagnosis and treatment (refer to Section 24 Sleep disorders).

15.3 Temporary illnesses

The Standard does not presume to deal with the myriad of conditions that may affect health on a short-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Such conditions may include recurrent respiratory infections, post-major surgery, severe migraine, fractures to limbs or situational stress.

Clinical judgment is usually required on a case-by-case basis with reference to the principles outline in Figure 5. Some conditions primarily affect a pilot's ability to use the pilot ladder but do not affect their ability to perform pilotage functions. In such cases transfer by helicopter, if available, may be considered.

16 Blackouts

16.1 Relevance to marine pilots

Unpredictable, spontaneous loss of consciousness is incompatible with piloting ships and climbing ladders.

16.2 General assessment and management guidelines

16.2.1 General considerations

Blackout may arise from various causes, including:

- cardiac syncope (e.g. arrhythmias, flow obstruction);
- hypotension due to inappropriate vasodilation (e.g. vasovagal faints, autonomic system disorder);
- neurogenic (e.g. epilepsy, transient ischaemic attacks);
- metabolic (e.g. hypoglycaemia);
- psychiatric (e.g. hyperventilation, psychosomatic states);
- other uncommon conditions;
- unknown in spite of extensive investigation.

Blackouts should be managed as per Figure 12. Pilots should generally be classed as Temporarily Unfit for Duty until the cause of the blackout is established although some conditions causing blackout are temporarily (e.g. fainting in hot weather) and may not impact on fitness for duty. However in other cases determination of the cause of blackouts may be difficult and require extensive investigations and specialist referral.

For the purposes of this Standard, a syncopal event is defined as a loss of consciousness (blackout) arising from a cardiovascular cause.

16.2.2 Vasovagal syncope

The most common cause of transient loss of consciousness is vasovagal syncope ('fainting'). Where this has been triggered by a well-defined provoking factor or a situation that is unlikely to recur while working (e.g. prolonged standing, venepuncture or emotional situation), it is not necessary to restrict work. However, vasovagal syncope may also result from other causes that are not so benign. In such cases, fitness for pilotage work should be assessed according to the cardiovascular conditions standard for syncope (refer to Section 17 Cardiovascular fitness and diseases).

16.2.3 Blackouts due to medical causes not covered in the Standard

If the cause of the blackout is determined to be due to a medical condition not covered in the Standard then first principles regarding fitness for duty should be applied (refer to Section 15.1 Generic assessment). Considerations include the likelihood of recurrence of blackout and the treatability of the condition as well as the nature of the safety critical task. There should also be an appropriate review period.

16.2.4 Blackouts of undetermined mechanism

If despite extensive investigation, the mechanism of a blackout cannot be determined, fitness for duty should be assessed according to Table 7. The criteria for blackout of undetermined mechanism are similar to those for seizure.

16.3 Medical criteria

Where a firm diagnosis has been made, the criteria appropriate to the condition should be referred to elsewhere in this Standard.

It is important that health professionals familiarise themselves with both the general information previously described and the tabulated criteria before making an assessment of a person's fitness for duty.

Figure 12 Management of blackouts in marine pilots

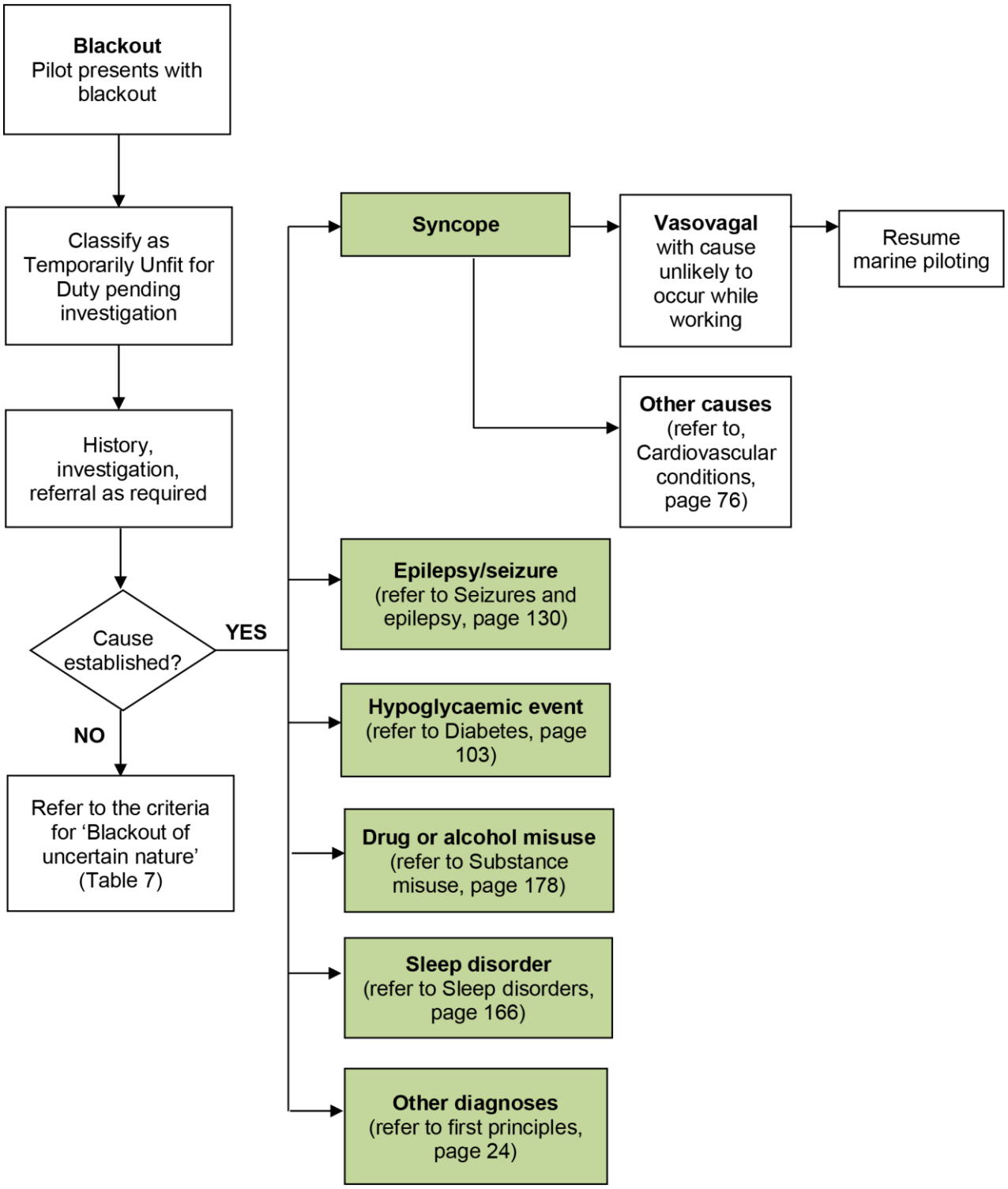


Table 7 Medical criteria for marine pilots – Blackouts

Table 7 Medical criteria for marine pilots – Blackouts	
Condition	**Criteria**
Blackouts: episode(s) of impaired consciousness of uncertain nature	A pilot is not Fit for Duty Unconditional: • if the pilot has experienced blackouts that cannot be diagnosed as syncope, seizure or another condition. If there has been a single blackout or more than one blackout within a 24-hour period, Fit for Duty Subject to Review may be determined subject to at least annual review, taking into account information provided by an appropriate specialist as to whether the following criterion is met: • there have been no further blackouts for at least 5 years. If there have been 2 or more blackouts separated by at least 24 hours, Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account information provided by an appropriate specialist as to whether the following criterion is met: • there have been no further blackouts for at least 10 years.
Exceptional cases	Where a pilot with one or more blackouts of undetermined mechanism does not meet the above criteria, Fit for Duty Subject to Review may be determined, based on consideration of the nature of the task and subject to annual review: • if, in the opinion of the treating specialist and in consultation with the Authorised Health Professional the risk to pilotage caused by a blackout is acceptably low.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

References and further reading

Austroads Inc.& NTC (National Transport Commission) 2016, Assessing fitness to drive, commercial and private vehicle drivers: medical standards for licensing and clinical management guidelines, Austroads Inc, and NTC, Sydney. www.austroads.com.au

National Transport Commission 2017, National Standard for Health Assessment of Rail Safety Workers. https://www.ntc.gov.au/Media/Reports/(7B079897-1863-CA93-474F-AD96AD9C6C3F).pdf

Sorajja D, Nesbitt GC, Hodge DO, Low PA, Hammill SC, Gersh BJ & Shen WK. Syncope while driving: clinical characteristics, causes, and prognosis. Circulation. 2009;15(120):928–934. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3918881/

17 Cardiovascular fitness and diseases

17.1 Relevance to marine pilots

17.1.1 Effects of cardiovascular conditions on pilotage work

Cardiorespiratory fitness of a high order is required for pilotage work. This is particularly in relation to climbing the pilot's ladder and then climbing 6-7 flights of stairs to reach the bridge. It is important the pilot is in good physical condition on reaching the bridge and not exhausted because the subsequent work involves high mental demands.

Collapse or loss of concentration due to other cardiac symptoms such as palpitations may jeopardise control of the ship at critical times. However, should collapse occur, others on the bridge may take appropriate action to mitigate the consequences, possibly in conjunction with tugs and harbour control.

Symptomatic heart disease as well as asymptomatic disease needs to be detected. This is possible by using screening tests beginning with the Cardiac Risk Score as well as VO_2 max testing and clinical examination.

A marine pilot who is asymptomatic but found to have an increased likelihood of a heart attack on a Cardiac Risk Score, should be assessed more fully than an ordinary patient because of the risks they pose to public safety.

Cardiovascular disease also may have end organ effects such as on the brain (stroke), vasculature of the extremities and vision. The relevant sections should be referred to for advice on assessment of these effects.

There are a few epidemiological studies of the health of pilots which have mainly found average or low cardiovascular mortality indicating this is not a high-risk group[14].

17.1.2 Effects of marine piloting on the heart

A further problem in those who have established ischaemic heart disease is that pilotage work such as marine piloting causes occasional emotional and sensorimotor arousal leading to a faster heart rate and fluctuation in blood pressure. Such pilots may need to respond to an emergency, which theoretically could trigger angina, or even infarction.

Pilots work in environments with electromagnetic fields. For example they extensively use hand held VHF radios with a power of up to 5W, and are sometimes in close proximity to antennae (’monkey island‘). These fields may cause interference with medical devices such as cardiac pacemakers. This is discussed further in the following pages.

[14] Saarni et al. *Mortality among Finnish sea pilots 1956 - 85*. Occupational medicine 1996; 46; 281 – 284

17.2 General assessment and management guidelines

17.2.1 Cardiac risk assessment

Assessment of cardiac risk involves clinical assessment as well as a cardiac risk level measurement. Clinical assessment includes the evaluation of information such as:

- symptoms, such as chest pain or palpitations that may cause distraction from pilotage work, as well as being a harbinger of possible collapse;
- family history, such as first-degree relatives having cardiovascular events in midlife;
- past history;
- comorbidities such as obesity, inactivity, obstructive sleep apnoea and depression; and
- work factors such as exposure to climatic extremes in course of work.

All information should be used in assessing fitness. Clinical judgement may be needed to determine if a person is Fit for Duty, Fit for Duty Subject to Review or Temporarily Unfit for Duty while being further assessed.

Cardiac risk level

The health assessment incorporates the cardiac risk level as a tool for predicting risk of a cardiovascular event, and in particular heart attack, during a 5 year period. It considerably increases the power of the assessment to identify pilots at risk of sudden incapacity and to guide their management.

The Australian absolute cardiovascular disease web-based calculator should be used to calculate risk so as to ensure uniformity http://www.cvdcheck.org.au/. Where the online calculator is not available, the tables in Figure 13 may also be used. (https://www.heartfoundation.org.au/images/uploads/publications/aust-cardiovascular-risk-charts.pdf)

1. Data collection

Obtain the following information for the cardiac risk level calculator:

- age and sex;
- whether or not the patient smokes cigarettes;
- blood pressure as measured supine;
- TC:HDL ratio - calculated based on fasting blood for total cholesterol (TC) and high-density lipoprotein (HDL); and
- whether diabetic (a pilot is diabetic if they are under treatment for diabetes or if diabetes is confirmed on HbA1c testing (refer to Section 18 Diabetes).
- ECG - report specifically requiring information regarding presence of left ventricular hypertrophy[15];

[15] Left Ventricular Hypertrophy (LVH) - The Sokolow-Lyon criterion for LVH is met if the amplitude of the S wave in V1 added to the amplitude of the R wave in V5 is greater than 35mm. There are other considerations, with LVH regarded as more severe if there are additional S-T and T wave changes.

2. Determine risk level

The Australian absolute cardiovascular disease web-based calculator should be used to calculate risk so as to ensure uniformity http://www.cvdcheck.org.au/. Where the online calculator is not available, the charts in Figure 13 may also be used. (https://www.heartfoundation.org.au/images/uploads/publications/aust-cardiovascular-risk-charts.pdf)

Within the chart, the cell nearest to the person's age, systolic blood pressure and total cholesterol:HDL ratio should be used. Pilots who fall exactly on a threshold between cells should be placed in the cell indicating a higher risk. For example, pilots less than 35 years old should be managed as if they are 35 years old.

3. Stratification and risk management (refer to Figure 14)

The cardiac risk level is associated with a probability of a cardiovascular event in the next 5 years. The higher the cardiac risk level, the higher the probability of an event. Therefore, management of pilots is determined partly by their risk level and partly by their overall cardiac risk assessment.

- **Probability ≥ 25% in 5 years (red and orange cells).** The pilot is unfit for work. They should be referred for a stress electrocardiograph (ECG) and classed as Temporarily Unfit for Duty pending results and appropriate management.
- **Probability 10–24% in 5 years (light orange, yellow and blue cells).** The pilot is referred for a stress ECG. While awaiting results of the ECG, the pilot may be assessed as Fit for Duty Subject to Review or Temporarily Unfit for Duty, depending on the overall cardiac risk assessment.
- **Probability 5–9% in 5 years (dark green cells).** The pilot is assessed for specific risk factors and overall cardiac risk including obesity, physical activity and family history. The pilot may be managed by referral to their general practitioner for risk factor modification, a stress ECG and/or other tests as clinically appropriate. While awaiting results of further investigations, the pilot may be classed as Fit for Duty Subject to Review or Temporarily Unfit for Duty, depending on the overall assessment.
- **Probability < 5% in 5 years (light green cells).** The pilot is assessed regarding overall cardiac risk assessment and managed accordingly including referral to their general practitioner as required. They may be classed as Fit for Duty or Fit for Duty Subject to Review, depending on the overall assessment.

Stress electrocardiograph

The stress ECG should be conducted using the Bruce protocol or equivalent functional exercise test protocol, bearing in mind the musculoskeletal requirements of the task (refer to Section 20 Musculoskeletal conditions). The exercise capacity should be greater than or equal to 90% of the age/sex predicted capacity (refer to Figure 15). Where a stress ECG is positive or clinical assessment warrants it, referral to a cardiologist should be made for further assessment and advice on management. The results of a stress ECG are valid for up to 2 years, provided that the person remains asymptomatic.

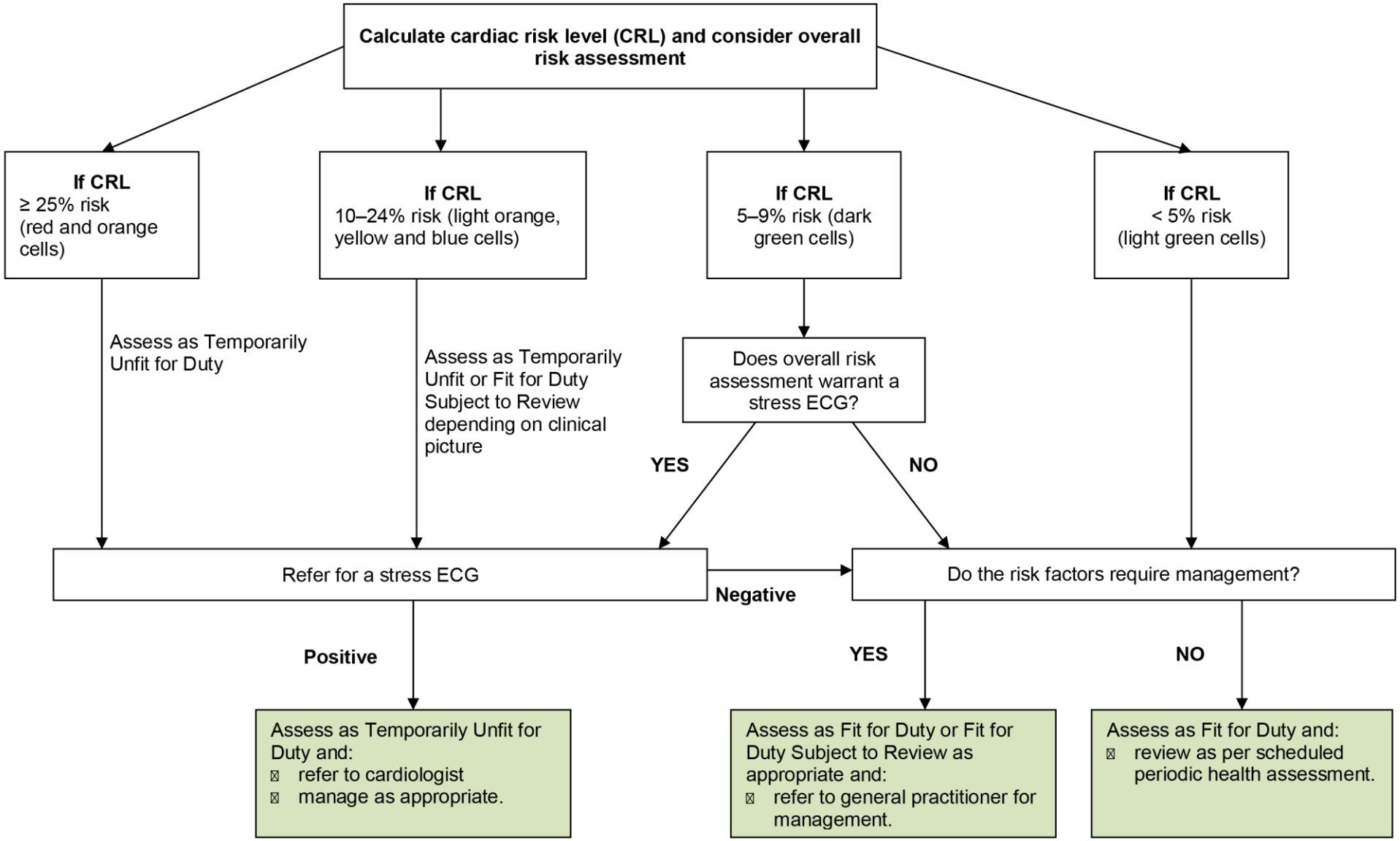
Management of risk factors

Where risk factors are identified, such as having increased blood pressure or being a smoker, the pilot should be referred to their general practitioner and other appropriate programs. The pilot should be reviewed to monitor management of their risk factor profile. Where hypertension is identified as a risk factor, also refer to the section on hypertension.

Figure 13 Coronary heart disease risk factor prediction chart

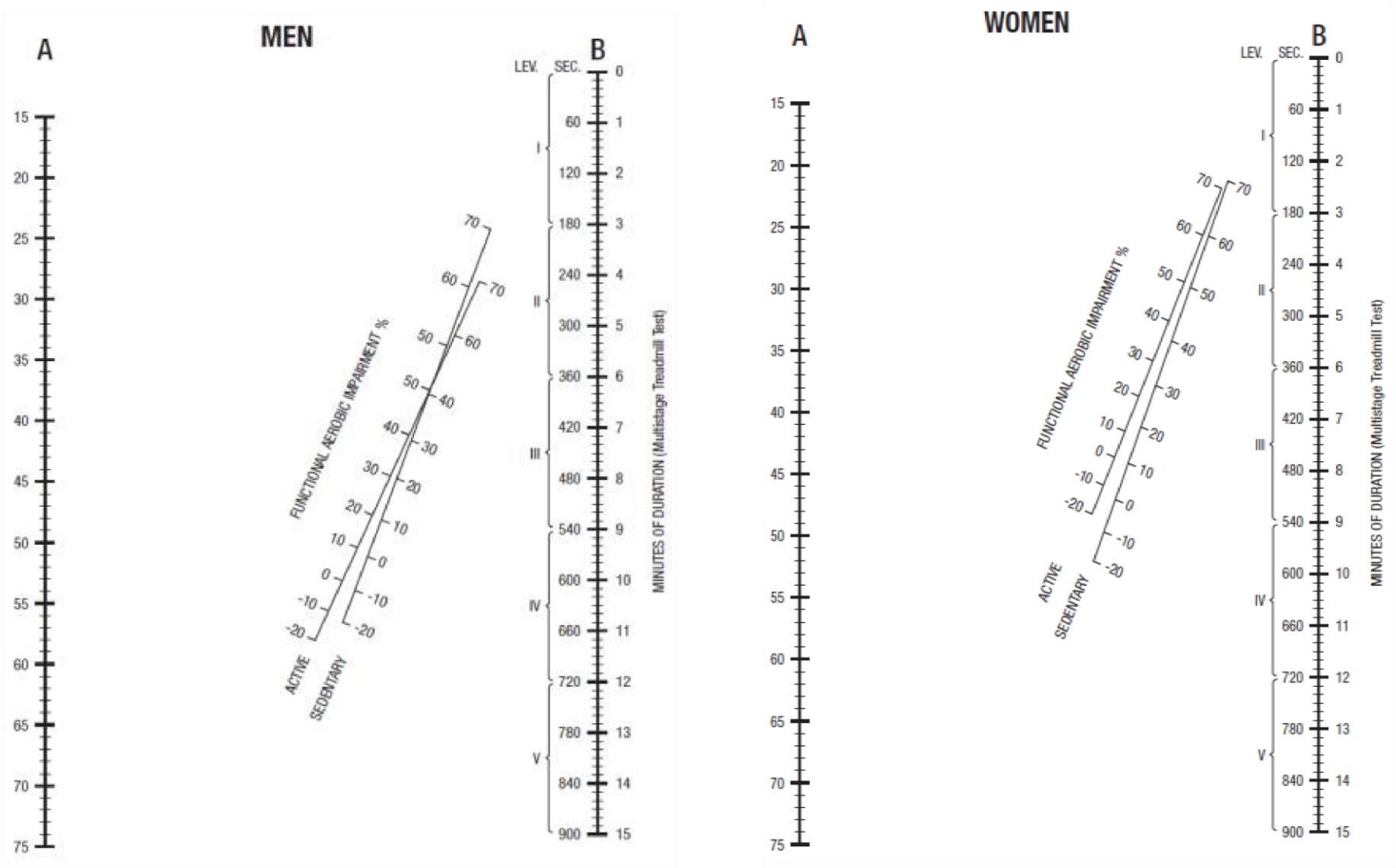
Source: Reproduced with permission from the *Absolute cardiovascular disease risk assessment. Quick reference guide for health professionals*, an initiative of the National Vascular Disease Prevention Alliance. © 2009 National Heart Foundation of Australia

Figure 14 Management of cardiac risk level



CRL = cardiac risk level; ECG = electrocardiograph

Figure 15 Bruce protocol nomogram for men and women



Source: Reproduced with permission from the Department of Cardiology, School of Medicine, University of Washington Source: Reproduced with permission from the Department of Cardiology, School of Medicine, University of Washington

17.2.2 Cardiorespiratory fitness (VO_2 max)

Cardiorespiratory fitness of a high degree is required for pilotage work particularly for climbing the pilot's ladder and up to six storeys of stairs to reach the bridge. It is important the pilot is in good physical condition on reaching the bridge and not exhausted because the subsequent work involves high mental demands.

Cardiorespiratory fitness may be assessed by measuring maximal oxygen uptake (VO_2 max). This is an estimate of the capacity to transport and utilize oxygen during incremental exercise. It is usually expressed in millilitres of oxygen per kilogram of bodyweight per minute (ml/kg/min).

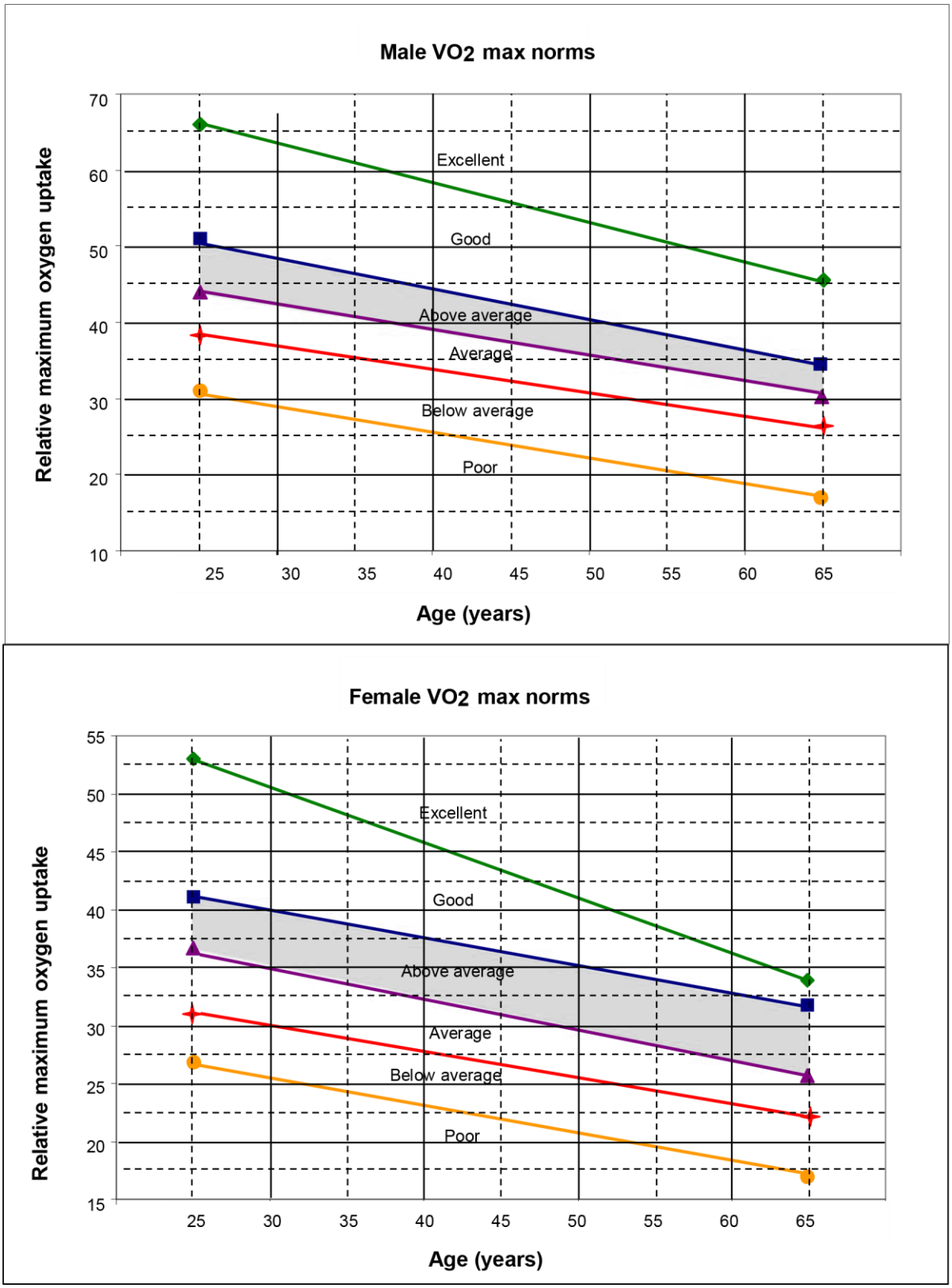
VO_2 Max tests

VO_2 may be indirectly measured using various tests. A step test is preferred as it is similar to climbing the ladder and stairs. Step tests include the Chester, Queens College and YMCA tests. The choice of test should give consideration to the anthropometry of the pilot. The resulting VO2max value should be compared to normal values by age and sex (Figure 16). Direct VO_2 measurement is the definitive test.

Initial Licensing Health Assessment - At recruitment/initial licensing a pilot should be in the 'above average' or better range.

Periodic Health Assessments - The trend for should be noted at each assessment allowing for a trend with age. If there is an untoward trend, the reasons for this should be discussed and investigated as appropriate, in conjunction with the general practitioner. If the decrease is to the 'average' range the pilot should be categorised Fit Subject to Review until the cause is determined and fitness satisfactorily recovered. If the decrease is to 'below average' the pilot should be categorised Temporarily Unfit for Duty until the cause is determined and fitness satisfactorily recovered.

Figure 16 Male and female VO_2 max norms



Adapted from: Gore CJ, Edwards DA. Australian Fitness Norms: A manual for fitness assessors (Eds). The Health Development Foundation. North Adelaide, SA. 1992

17.2.3 Ischaemic heart disease and related interventions

In individuals with ischaemic heart disease, the severity rather than the mere presence of ischaemic heart disease should be the primary consideration when assessing fitness for duty. The Authorised Health Professional should consider if any symptoms are of sufficient severity to be a risk to attentiveness while working as well as the risk of sudden collapse. Those who have had a previous myocardial infarction or similar event are at greater risk of recurrence than the normal population, thus cardiac history is an important consideration.

Exercise testing

The Bruce protocol is recommended for formal exercise testing. Nomograms for assessing functional capacity are shown in Figure 15.

Suspected angina pectoris

Where chest pains of uncertain origin are reported the pilot should be categorised as Temporally Unfit for Duty until cardiovascular or other serious disease is excluded. If the tests are positive, or the person remains symptomatic and requires antianginal medication for the control of symptoms, the requirements listed for proven angina pectoris apply (refer to Table 9).

17.2.4 Cardiac surgery

Cardiac surgery may be performed for various reasons including valve replacement, excision of atrial myxoma or correction of septal defects. In some cases this is curative of the underlying disorder and so will not affect fitness for duty in the long term, although the pilot should be classed Temporarily Unfit for Duty (refer also to regarding non-working periods).

In other cases the condition may not be stabilised and needs to be individually assessed. All cardiac surgery patients should be advised regarding returning to pilotage work in the short-term as for any other post-surgery patient and may be classed as Temporarily Unfit for Duty. After thoracotomy an assessment will need to be made of the strength of the pilot's arms and their ability to resume climbing pilot’s ladders safely.

17.2.5 Disorders of rate, rhythm and conduction

Pilots with recurrent arrhythmias causing syncope or presyncope are usually not fit for duty. A classification of Fit for Duty Subject to Review may be considered after appropriate treatment and a non-working period (refer to Table 8).

An implantable cardioverter defibrillator (ICD) is incompatible with performing pilotage work because discharge can cause chest pain and throw the implantee to the ground. This applies to ICDs implanted for secondary or primary prevention.

There is a wide diversity of ECG changes and a diversity of consequences arising from these changes. Sometimes palpitations, and hence loss of attentiveness, may occur. Occasionally there is a risk of collapse. Each case needs to be individually assessed as to the potential consequences and impacts on the pilotage work being undertaken.

Pilots treated with pacemakers, defibrillators or other electronic devices should have their devices assessed for sensitivity to electromagnetic fields (static, extremely low frequency or

radiofrequency) that are likely to be present in their work environment and may cause interference with the device.

17.2.6 Vascular disease

Aneurysms

Thoracic aortic aneurysms are largely asymptomatic until a sudden and catastrophic event occurs, such as rupture or dissection. Such events are rapidly fatal in a large proportion of patients and are therefore relevant pilots. Risk varies with the type and size of aneurysm. The criteria vary for artherosclerotic aneurysm or aneurysm associated with bicuspid aortic valve, compared to aneurysm associated with genetic aortopathy, including Marfan Loeys-Dietz, Turner and Ehlers-Danlos syndromes, and familial aortopathy.

Deep vein thrombosis and pulmonary embolism

Although deep vein thrombosis (DVT) may lead to an acute pulmonary embolus (PE), there is little evidence that such an event affects safety. Therefore, there is no standard for either DVT or PE per se, although non-working periods (Temporarily Unfit for Duty) are advised (refer to Table 8). If long-term anticoagulation treatment is prescribed, the standard for anticoagulant therapy should be applied (refer to Section 17.2.9 Other cardiovascular conditions).

Valvular disease

Valvular disease may present with diverse symptoms including exertional dyspnoea, palpitations, angina, syncope, cardiac arrest or heart failure. It may also be asymptomatic and found on examination. The symptoms, if severe, may cause distraction from work and as such are relevant to pilots. The risk of collapse is particularly relevant.

17.2.7 Myocardial disease

The dilated and hypertrophic cardiomyopathies may present with diverse symptoms, including exertional dyspnoea, palpitations, angina, syncope, cardiac arrest or heart failure. They may also be asymptomatic and found on examination. The symptoms, if severe, may cause distraction from work and as such are relevant to pilots and the risk of collapse is particularly relevant.

Specific criteria are set for the complications of cardiac arrest, heart failure and implanted devices (refer to Table 9).

There are several other causes of myocardial disease. These may be managed using the principles for the cardiomyopathies or by consideration of the basic principles regarding pilotage work.

17.2.8 Other cardiovascular conditions

Long-term anticoagulant therapy

Long-term anticoagulant therapy may be used to lessen the risk of emboli in disorders of cardiac rhythm, following valve replacement, for deep venous thrombosis and so on. If not adequately controlled, there is a risk of bleeding that may acutely affect pilotage, such as an intracranial bleed. Pilots on long-term anticoagulant therapy do not meet the criteria, but may be classed as Fit for Duty Subject to Review if their therapy is adequate and stable.

Hypertension

Hypertension is associated with increased risk of heart attack and stroke, which is particularly important in marine pilots. Assessment of pilots with high blood pressure should include end organ damage relevant to safe working, the presence of other risk factors, which increase the likelihood of cardiovascular event, and the possibility that treatment may cause hypotension.

- ***Pilots with blood pressure levels ≥170/100*** should be managed as follows (refer Figure 17). Those with blood pressure 170-199/100-109 should be categorised Fit Subject to Review and referred to their general practitioner for assessment and treatment. White coat hypertension should be excluded. If high blood pressure is confirmed it should be treated. If after four weeks of treatment levels remain ≥170-100, the person should be classed Temporarily Unfit for Duty and referred to a specialist. On the other hand, if the blood pressure is satisfactorily controlled, the cardiac risk level should then be calculated (Figure 14) and the person managed according to the flow chart in Figure 17. In addition the effects of medication on pilotage work and any end organ effects as per this publication will need to be considered regarding fitness.
- ***Those with blood pressure ≥200/110***, or those whose blood pressure remains >170/100 after 4 weeks of treatment by their general practitioner, should be classed as Temporarily Unfit for Duty and referred to a specialist for investigation and treatment. Fit for Duty Subject to Review may be determined if their blood pressure can be reduced to <170/100 over 4 weeks. These pilots should have their cardiac risk level assessed and managed accordingly (Figure 14). In addition the effects of medication on pilotage work and any end organ affects as per this publication will need to be considered regarding fitness.
- ***Pilots whose blood pressure remains ≥170/100*** after specialist investigation and treatment will be categorised Permanently Unfit for Duty.

Where causative factors of hypertension have been identified and cured the pilot should initially be classed Fit for Duty Subject to Review but after adequate follow-up shows blood pressure is normal may be exempted from review.

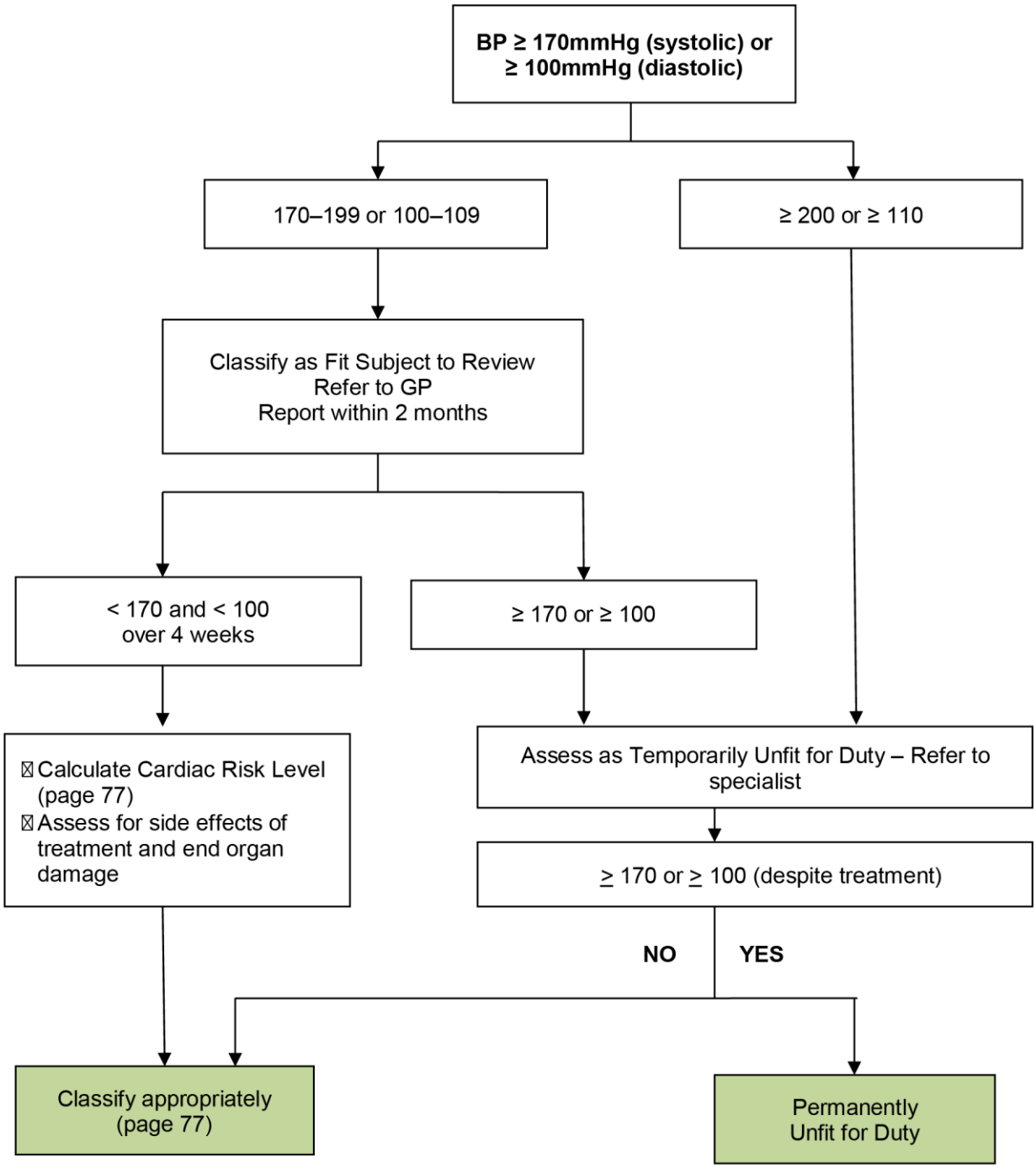
Syncope

If an episode of syncope is vasovagal in nature with a clear-cut precipitating factor (e.g. venesection), and the situation is unlikely to occur while performing pilotage, the pilot may generally resume work within 24 hours. With syncope due to other cardiovascular causes, a pilot should not perform pilotage for at least 3 months, after which time their ongoing fitness for duty should be assessed. In cases where it is not possible to be certain that an episode of loss of consciousness is due to syncope or some other causes (refer to Section 16.2.4 Blackouts of undetermined mechanism).

Electro-magnetic interference (EMI)

Pilots work in environments with electromagnetic fields. For example they extensively use hand held VHF radios with a power of up to 5W, and are sometimes in close proximity to 'monkey island'. These fields may cause interference with medical devices such as cardiac pacemakers. Pacemakers are usually implanted under the clavicle (collarbone) and hence are close to the hand-held radios. A major manufacturer of pacemakers (Medtronic) advises avoidance of interference by maintaining a distance of 6 inches /15 cm for radio sources of 3 W or less, and a distance of 12 inches (30 cm) for sources of 3- 15W. Therefore use of a hand-held radio may cause interference with the pacemaker. In the event of a pacemaker being prescribed this will need careful discussion with the manufacturer and cardiologist regarding the risks of interference and the consequences should it occur, noting that most pacemakers are 'fail-safe' and hand-held radios are not used when on the ladder.

Figure 17 Management of high blood pressure



BP = blood pressure (all measured in mmHg)

17.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 9.

There are two aspects of the medical criteria regarding cardiac conditions and pilots. One is the non-working period (Temporarily Unfit for Duty) following a cardiac event or intervention and the other is the criteria regarding long-term fitness for duty in relation to a range of cardiovascular conditions.

17.3.1 Non-working periods

A number of cardiovascular incidents and procedures may impact on short-term and long-term fitness for duty, for example, AMI or aneurysm repair. Such situations present an obvious risk. The pilot should be categorised as Temporarily Unfit for Duty and should not undertake piloting duties for the appropriate period, as laid out in Table 8. The recommendations regarding fitness for duty should be considered once the condition has stabilised and work capacity can be assessed (including VO_2 max, see above) per the criteria outlined in this chapter.

Table 8 Minimum non-working periods post cardiovascular events or procedures

Event / Procedure	Minimum non- working period for marine pilots
Ischaemic events	
Acute myocardial infarction	3 months
Angioplasty	4 weeks
Coronary artery by-pass grafts	3 months
Disorders of rate and rhythm	
Cardiac arrest	As determined by treating specialist
Cardiac pacemaker insertion	1 month
Cardiac defibrillator	N/A
Vascular disease	
Aneurysm repair	3 months
Valvular replacement (including treatment with mitra clips and transcutaneous aortic valve replacement)	3 months
Other	
Deep vein thrombosis	As determined by treating specialist
Heart/ lung transplant	3 months
Pulmonary embolism	As determined by treating specialist
Syncope	3 months

17.3.2 Criteria for long-term fitness for duty

Criteria for chronic disorders are made with the presumption that the disorder is stable and well controlled. If this is not the case, a specialist consultation should be conducted and the pilot may need to be categorised Temporarily Unfit for Duty while such opinion is being sought. A classification of Fit for Duty Subject to Review may be determined after initial assessment by an appropriate specialist.

Requirements for safe working are included in Table 10 for the following conditions:

- **Ischaemic heart disease**
  - acute myocardial infarction
  - angina
  - coronary artery bypass grafting
  - percutaneous coronary intervention
- **Disorders of rate, rhythm and conduction**
  - arrhythmia
  - cardiac arrest
  - cardiac pacemaker
  - implantable cardioverter defibrillator
  - ECG changes
- **Vascular disease**
  - aneurysms (abdominal and thoracic)
  - deep vein thrombosis
  - pulmonary embolism
  - valvular heart disease
- **Myocardial diseases**
  - dilated cardiomyopathy
  - hypertrophic cardiomyopathy
- **Other conditions and treatments**
  - anticoagulant therapy
  - congenital disorders
  - heart failure
  - heart transplant
  - hypertension
  - stroke
  - syncope.

Because many cardiac conditions are stabilised and not cured, the pilot usually should be categorised as Fit for Duty Subject to Review. In general, the review interval should not exceed 12 months for pilots with diagnosed cardiac disease (as distinct from raised risk factors).

Where a condition has been effectively treated and there is minimal risk of recurrence, the pilot may be categorised as Fit for Duty (with no requirements for more frequent review) on the advice of a specialist.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a pilot's fitness for duty.

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Condition	**Criteria**
Cardiac risk level *(Refer to text and flow chart)*	The cardiac risk level is to be interpreted in the context of overall cardiovascular risk assessment. For details of management, refer to the text in Section 17.2 General assessment and management guidelines) If cardiac risk level has a: • Probability of ≥ 25% in 5 years **(red and orange cells)**: pilot is unfit for Category 1 Pilotage work. Refer for stress ECG and classify as Temporarily Unfit for Duty pending results. Review annually. • Probability of 10–24% in 5 years **(light orange, yellow and blue cells)**: refer for stress ECG. While awaiting results, classify as Fit for Duty Subject to Review or Temporarily Unfit for Duty depending on overall risk assessment. Review annually. • Probability of 5–9% in 5 years **(dark green cells)**: refer to general practitioner for risk factor modification or refer for stress ECG if appropriate. While awaiting investigation, classify as Fit for Duty Subject to Review or Temporarily Unfit for Duty depending on overall risk assessment. Review annually. • Probability of < 5% in 5 years **(light green cells)**: assess risk factors and other clinical data, and refer to general practitioner as appropriate. Classify as Fit for Duty or Fit for Duty Subject to Review depending on overall risk assessment. Review as appropriate. Refer to related criteria as required (e.g. hypertension and diabetes).
Cardiorespiratory fitness - VO_2 max	• *Initial licensing / recruitment.* At recruitment the VO_2 max should be in the 'above average' or better range. • *Periodic Health Assessments.* The VO_2 max trend should be noted at each examination allowing for a trend with age. If there is an untoward trend, the reasons for this should be discussed and investigated as appropriate, in conjunction with the general practitioner. If the decrease is to the 'average' range the pilot should be categorised Fit Subject to Review until the cause is determined and fitness satisfactorily recovered. If the decrease is to 'below average' the pilot should be categorised Temporarily Unfit for Duty until the cause is determined and fitness satisfactorily recovered.

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Ischaemic heart disease	
Acute myocardial infarction (AMI) *Refer also to percutaneous coronary intervention (PCI)* *Refer also to coronary artery bypass grafting (CABG)*	**The pilot should be categorised Temporarily Unfit for Duty for at least 4 weeks following an acute myocardial infarction.** A pilot is not Fit for Duty Unconditional: • if the pilot has had an acute myocardial infarction. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the criteria described below are met. • it is at least 4 weeks after an uncomplicated acute myocardial infarction; and • there is a satisfactory response to treatment; and • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • the VO_2 max is in the 'above average' range for age; and • there is no evidence of severe ischaemia (i.e. < 2 mm ST segment depression on an exercise ECG, or a reversible regional wall abnormality on an exercise stress ECG, or absence of a large defect on a stress perfusion scan); and • there is an ejection fraction of ≥ 40%; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Angina	A pilot is not Fit for Duty Unconditional: • if the pilot is subject to angina pectoris. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • the VO_2 max is in the 'above average' range for age; and • there is no evidence of severe ischaemia (i.e. < 2 mm ST segment depression on an exercise ECG or a reversible regional wall abnormality on an exercise stress echocardiogram or absence of a large defect on a stress perfusion scan); and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Angina (continued)	***Myocardial ischaemia*** If myocardial ischaemia is demonstrated (as per the criteria above), a coronary angiogram may be offered. The pilot may be categorised as Fit for Duty Subject to (annual) Review: • if the result of the angiogram shows lumen diameter reduction of < 70% in a major coronary branch and < 50% in the left main coronary artery. If the result of the angiogram shows a lumen diameter reduction of ≥ 70% in a major coronary branch and < 50% in the left main coronary artery (or if an angiogram is not conducted), Fit for Duty Subject to (annual) Review may be considered if: • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • the VO_2 max is in the 'above average' range for age; and • there is no evidence of severe ischaemia (i.e. < 2mm ST segment depression on an exercise ECG or a reversible regional wall abnormality on an exercise stress echocardiogram or absence of a large defect on a stress perfusion scan); and • there is an ejection fraction of ≥ 40%; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness). Where surgery or percutaneous coronary intervention (PCI) is undertaken to relieve the angina, the requirements listed for PCI apply (see below).
Coronary artery bypass grafting (CABG)	**A pilot should be categorised Temporarily Unfit for Duty for at least 3 months following coronary artery bypass grafting.** A pilot is not Fit for Duty Unconditional: • if the pilot requires or has had coronary artery bypass grafting. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • it is at least 3 months after coronary artery bypass grafting; and • there is a satisfactory response to treatment; and • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and *(continued overleaf)*

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Coronary artery bypass grafting (CABG) (continued)	• the VO_2 max is in the 'above average' range for age; and • there is no evidence of severe ischaemia (i.e. < 2mm ST segment depression on an exercise ECG or a reversible regional wall abnormality on an exercise stress echocardiogram or absence of a large defect on a stress perfusion scan); and • there is an ejection fraction of $\geq$ 40%; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness); and • there is minimal residual musculoskeletal pain after the chest surgery.
Percutaneous coronary intervention (PCI) (e.g. angioplasty)	**A pilot should be categorised Temporarily Unfit for Duty for at least 4 weeks after percutaneous coronary intervention (PCI).** A pilot is not Fit for Duty Unconditional: • if the pilot requires or has had PCI. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • it is at least 4 weeks after the PCI; and • there is a satisfactory response to treatment; and • there is an exercise tolerance of $\geq$ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • the VO_2 max is in the 'above average' range for age; and • there is no evidence of severe ischaemia (i.e. < 2mm ST segment depression on an exercise ECG or a reversible regional wall abnormality on an exercise stress echocardiogram or absence of a large defect on a stress perfusion scan); and • there is an ejection fraction of $\geq$ 40%; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Disorders of rate, rhythm and conduction	
Atrial fibrillation	**The non-working period will depend on the method of treatment (see below).** A pilot is not Fit for Duty Unconditional: • if the pilot has a history of recurrent or persistent arrhythmia, which may result in syncope or incapacitating symptoms. Fit for Duty Subject to Review* may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether any of the following criteria are met:

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Atrial fibrillation (continued)	• there is a satisfactory response to treatment; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness); and • subject to appropriate follow-up. *Where the condition is considered to be cured, the requirement for periodic review may be waived. The pilot should not perform pilotage work for: • at least 4 weeks following percutaneous intervention; • at least 4 weeks following initiation of successful medical treatment; • at least 3 months following open chest surgery. If the pilot is taking anticoagulants, refer to the anticoagulant therapy section, below.
Paroxysmal arrhythmias (e.g. supraventricular tachycardia [SVT] atrial flutter, idiopathic ventricular tachycardia)	**A pilot should be categorised Temporarily Unfit for Duty for at least 4 weeks following near or definite collapse due to paroxysmal arrhythmia.** A pilot is not Fit for Duty Unconditional: • if there was near or definite collapse. Fit for Duty Subject to Review* may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • there is a satisfactory response to treatment; and • there are normal haemodynamic responses at a moderate level of exercise; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness). *Where the condition is considered to be cured, the requirement for periodic review may be waived. The pilot should not perform pilotage: • for at least 4 weeks following percutaneous intervention; • for at least 4 weeks following initiation of successful medical treatment. If the pilot is taking anticoagulants, refer to the anticoagulant therapy section, below.

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Cardiac arrest	**A pilot should be categorised Temporarily Unfit for Duty for at least 6 months following a cardiac arrest.** A pilot is not Fit for Duty Unconditional: • if the pilot has suffered a cardiac arrest. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • it is at least 6 months after the arrest; and • a reversible cause is identified and recurrence is unlikely; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Cardiac pacemaker	**A pilot should be categorised Temporarily Unfit for Duty for at least 4 weeks after insertion of a pacemaker.** A pilot is not Fit for Duty Unconditional: • if a cardiac pacemaker is required, or has been implanted or replaced. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • it is at least 4 weeks after insertion of the cardiac pacemaker; and • the relative risks of pacemaker dysfunction have been considered; and • there are normal haemodynamic responses at a moderate level of exercise; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Implantable cardiac defibrillator (ICD)	A pilot is not Fit for Duty: • if the pilot requires or has an ICD for ventricular arrhythmias, including those implanted for prophylaxis.
ECG changes (e.g. strain patterns, bundle branch blocks or heart block and left ventricular hypertrophy)	**The pilot should be categorised Temporarily Unfit for Duty for at least 3 months following initiation of treatment.** A pilot is not Fit for Duty Unconditional: • if the pilot has an ECG abnormality, for example, left bundle branch block, right bundle branch block, pre-excitation, prolonged QT interval or left ventricular hypertrophy, or changes suggestive of myocardial ischaemia or previous myocardial infarction.

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
ECG changes (continued)	Fit for Duty Subject to Review* may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • if the condition has been treated medically for at least 3 months or follow-up investigation has excluded underlying cardiac disease; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness). *Where the condition is considered to be cured, the requirement for periodic review may be waived.
Vascular disease	
Aneurysms (abdominal and thoracic)	A pilot is not Fit for Duty Unconditional: • if the pilot has an unrepaired aortic aneurysm, thoracic or abdominal. **The pilot should be categorised Temporarily Unfit for Duty for at least 3 months post-repair.** Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether either of the following criteria are met: • the aneurysm (repaired or unrepaired) is less than 50mm for aneurysm associated with genetic aortopathy; or • the aneurysm (repaired or unrepaired) is less than 55mm for artherosclerotic aneurysm or aneurysm associated with the bicuspid aortic valve; and • in the case of repaired aneurysm, it is at least three months after repair.
Deep vein thrombosis (DVT)	**A pilot should be categorised Temporarily Unfit for Duty for at least 2 weeks after a DVT.** There are no specific criteria for long-term fitness for duty. For long-term anticoagulation see below. Also refer to Section 17.2 General assessment and management guidelines.
Pulmonary embolism (PE)	**A pilot should be categorised Temporarily Unfit for Duty for at least 6 weeks after a PE.** There are no specific criteria for long-term fitness for duty for PE. For long-term anticoagulation see below. Also refer to Section 17.2 General assessment and management guidelines.

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Valvular heart disease (including treatment with Mitra Clips and Transcutaneous Aortic Valve Replacement)	**A pilot should be categorised Temporarily Unfit for Duty for at least 3 months following valve repair.** A pilot is not Fit for Duty Unconditional: • if the pilot has any history or evidence of valve disease, with or without surgical repair or replacement, associated with symptoms or a history of embolism, arrhythmia, cardiac enlargement, abnormal ECG, high blood pressure, or • if the pilot is taking long-term anticoagulants. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • the pilot's cardiological assessment shows valvular disease of no haemodynamic significance; or • it is 3 months following surgery and there is no evidence of valvular dysfunction; and • the VO_2 max is in the 'above average' range for age; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness); and • there is minimal residual musculoskeletal pain after chest surgery.
Myocardial diseases	
Dilated cardiomyopathy (see also heart failure)	A pilot is not Fit for Duty Unconditional: • if the pilot has a dilated cardiomyopathy. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • the ejection fraction is ≥ 40%; and • the VO_2 max is in the 'above average' range for age; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness); and • the person is not subject to arrhythmias.
Hypertrophic cardiomyopathy (HCM)	A pilot is not Fit for Duty Unconditional: • if the pilot has HCM. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • the left ventricular ejection fraction is ≥ 40%; and • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
	• the VO_2 max is in the 'above average' range for age; and • there is an absence of a history of syncope, severe left ventricle hypertrophy, a family history of sudden death or ventricular arrhythmia on Holter testing; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Other cardiovascular diseases	
Anticoagulant therapy	A pilot is not Fit for Duty Unconditional: • if the pilot is on long-term anticoagulant therapy. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criterion is met: • anticoagulation is maintained at the appropriate degree for the underlying condition.
Congenital disorders	A pilot is not Fit for Duty Unconditional: • if the pilot has a complicated congenital heart disorder. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • there is a minor congenital heart disorder of no haemodynamic significance, such as pulmonary stenosis, atrial septal defect, small ventricular septal defect, bicuspid aortic valve, patent ductus arteriosus or mild coarctation of the aorta; and • the VO_2 max is in the 'above average' range for age; and • there are minimal symptoms relevant to performing pilotage (chest pain, palpitations, breathlessness).
Heart failure	A pilot is not Fit for Duty Unconditional: • if the pilot has heart failure. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • there is a satisfactory response to treatment; and • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • there is an ejection fraction of ≥ 40%; and • the VO_2 max is in the 'above average' range for age; and • the underlying cause of the heart failure is considered; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).

Table 9 Medical criteria for marine pilots – Cardiovascular fitness and diseases	
Heart transplant	**A pilot should be categorised Temporarily Unfit for Duty for at least 3 months after transplant.** A pilot is not Fit for Duty Unconditional: • if the pilot requires or has had a heart or heart/lung transplant. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • it is at least 3 months after transplant; and • there is a satisfactory response to treatment; and • there is an exercise tolerance of ≥ 90% of the age/sex predicted exercise capacity according to the Bruce protocol (or equivalent exercise test protocol); and • the VO_2 max is in the 'above average' range for age; and • there are minimal symptoms relevant to performing pilotage work (chest pain, palpitations, breathlessness).
Hypertension	A pilot is not Fit for Duty Unconditional: • if the pilot has blood pressure consistently ≥ 170 mmHg systolic or ≥ 100 mmHg diastolic (treated or untreated). Management of the pilot and subsequent categorisation will depend on: • the level of blood pressure; • the response to treatment; • the cardiac risk level; • the effects of medication relevant to pilotage work; and • the presence of end organ damage relevant to pilotage work. *For blood pressure between 170-199mmHg systolic or 100-109mmHg diastolic:* • The pilot should be categorised Fit Subject to Review and referred to their ***general practitioner*** for appropriate investigation and treatment. A report should be provided within 2 months. • If the pilot's blood pressure is <170 mmHg systolic and <100 mmHg diastolic after 4 weeks of treatment, they should have their cardiac risk level calculated based on the new level of blood pressure and they should be managed and categorised accordingly (refer to Figure 17), including whether they meet the following criteria: - there are no side effects from the medication that will impair pilotage work; and - there is no evidence of damage to target organs relevant to pilotage work.

Table 9	Medical criteria for marine pilots – Cardiovascular fitness and diseases
	• If the pilot's blood pressure remains ≥170/100 after 4 weeks of treatment, they should be categorised Temporarily Unfit for Duty and referred to an ***appropriate specialist*** for investigation and treatment. Categorisation will subsequently depend on response to treatment, the cardiac risk score and meeting of other criteria as above. • If blood pressure remains ≥170 mmHg systolic or ≥100 mm Hg diastolic despite treatment, the pilot should be categorised Permanently Unfit for Duty. *For blood pressure ≥200mmHg systolic or ≥100mmHg diastolic* • The pilot should be categorised Temporarily Unfit for Duty and referred to an ***appropriate specialist*** for investigation and treatment. • If the pilot's blood pressure is <170 mmHg systolic and <100 mmHg diastolic after 4 weeks of treatment, they should have their cardiac risk level calculated based on the new level of blood pressure and they should be managed and categorised accordingly (refer to Figure 17), including whether they meet the following criteria: - there are no side effects from the medication that will impair pilotage; and - there is no evidence of damage to target organs relevant to pilotage. • If blood pressure remains ≥170 mmHg systolic or ≥100 mmHg diastolic despite treatment, the pilot should be categorised Permanently Unfit for Duty.
Stroke	Refer to Section 21 Neurological Conditions
Syncope due to hypotension Refer also to Section 16 Blackouts	**The pilot could resume piloting work within 24 hours if the episode was vasovagal in nature with a clear-cut precipitating factor (e.g. venesection) and the situation is unlikely to occur while performing pilotage.** **A pilot should be categorised Temporarily Unfit for Duty for at least 3 months after syncope due to other cardiovascular causes.** A pilot is not Fit for Duty Unconditional: • if the condition is severe enough to cause episodes of loss of consciousness without warning. Fit for Duty Subject to Review may be determined, taking into account the nature of the work and information provided by the treating specialist as to whether the following criteria are met: • the underlying cause has been identified: and • satisfactory treatment has been instituted; and • the person has been symptom-free for 3 months.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

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18 Diabetes

(Refer also to Sections 17 Cardiovascular fitness and disease; 21 Neurological conditions, 24 Sleep disorders and 27 Vision and eye disorders)

18.1 Relevance to marine pilots

Diabetes may affect the ability to pilot a ship either through decreased cognitive performance or loss of consciousness in a hypoglycaemic episode, or from end organ effects on relevant functions, including effects on vision, the heart, the peripheral nerves and vasculature of the extremities, particularly the feet. Sleep apnoea is also more common in people with type 2 diabetes (refer to Section 24 Sleep Disorders).

The main hazard in marine pilots with diabetes is the occurrence of hypoglycaemia. It is mainly associated with insulin but can occur with oral treatments.

Pilots work shifts and need to be responsive to shipping movements which is not conducive to regular meal times.

There is also evidence that 'tighter control', as measured by the HbA1c, may be associated with increased vehicle crash risk.[16] This has implications for the management of pilots with diabetes in terms of targets for satisfactory control.

18.2 General assessment and management guidelines

General management of diabetes in relation to pilots is summarised in Figure 18.

For the purposes of this Standard, an appropriate medical specialist is an endocrinologist specialising in diabetes or a consultant physician specialising in diabetes.

18.2.1 Screening for diabetes

For the purposes of this Standard, diabetes may be diagnosed on history or on HbA1c testing* or on fasting or random blood glucose[17] .

- If HbA1c is equal to or greater than 53 mmol/mol (7.0%) regard as diabetic.
- If HbA1c is 48 mmol/mol (6.5%) or greater but less than 53 mmol/mol (7.0%) arrange a repeat (confirmatory) test.
  - If the repeat test is 48 mmol/mol (6.5%) or greater, diagnosis of diabetes is confirmed.
  - If the repeat test is less than 48 mmol/mol (6.5%), regard as non-diabetic and review as per normal periodic schedule.
- If the initial test is less than 48 mmol/mol (6.5%), regard as non-diabetic and review as per normal periodic schedule.

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*Note: any condition that leads to a shortened red cell survival time can interfere with the HbA1c assay. This includes the haemoglobinopathies, therapeutic venesection, anaemia, haemolysis, recent transfusion, and chronic renal failure. In this situation fasting blood glucose should be used with oral glucose tolerance testing as required.

18.2.2 Satisfactory control of diabetes

When assessing if a pilot with diabetes is fit to perform pilotage, individualised assessment of control is important. The pilot should be asked to bring their diabetes management plan to the assessment.

HbA1c is a reasonable indicator of control, however the general goal of HbA1c of less than 7.0% may not be applicable or safe for pilots due to increased risk of hypoglycaemia associated with tight control. If the HbA1c is 9.0% or higher, the Authorised Health Professional should usually refer the person to their treating specialist for review of their diabetes management, but the pilot may remain on duty.

For pilots on insulin treatment, blood glucose monitoring and other related records should be reviewed. The pilot should keep a diary of blood glucose levels, taking rosters into account, as agreed with the Authorised Health Professional. This is partly so the pilot knows they are safe for work and partly so that control of their diabetes can be readily checked at their review. In general, at least the last 3 months of blood glucose monitoring records should be reviewed. Work performance reports may be helpful in assessing if hypoglycaemia is interfering with safety critical decisions.

18.2.3 Input from treating doctor or specialist

When assessing a pilot with diabetes, a report from the treating specialist is generally required in order to determine fitness for duty. The report should include details of general health, indication of satisfactory diabetes control (as above) and freedom from severe complications.

For diabetes controlled by diet and exercise alone, a report from the treating general practitioner will suffice.

In the case of type 2 diabetes managed by oral agents alone, ongoing fitness for duty may be assessed based on information (including an HbA1c level) received from the treating general practitioner, by mutual agreement with the treating specialist. The initial recommendation of Fit for Duty Subject to Review must be based on the opinion of a specialist in diabetes.

Where appropriate and available, the use of telemedicine technologies such as videoconferencing is encouraged as a means of facilitating access to specialist opinion.

18.2.4 Hypoglycaemia

Definition: severe hypoglycaemic event

For the purpose of this document, a ‘severe hypoglycaemic event’ is defined as an event of hypoglycaemia of sufficient severity such that the person is unable to treat the hypoglycaemia themselves, and thus requires an outside party to administer treatment. It includes hypoglycaemia causing loss of consciousness. Episodes occurring during working time or at any other time of the day or night are relevant to the assessment in relation to this Standard.

A severe hypoglycaemic event is particularly relevant to pilotage because it affects brain function and may cause impairment of perception, motor skills or consciousness. It may also cause abnormal behaviour. A severe hypoglycaemic event is to be distinguished from mild hypoglycaemic events, with symptoms such as sweating, tremulousness, hunger and tingling around the mouth, which are common occurrences in the life of a person with diabetes treated with insulin and some hypoglycaemic agents.

Potential causes of hypoglycaemia

Hypoglycaemia may be caused by many factors, including non-adherence or alteration to medication, unexpected exertion, alcohol intake or irregular meals and reduced awareness (see below). Irregular meals and variability in medication administration may be an important consideration for those operating on shifts. Impairment of consciousness and judgement can develop rapidly.

Managing a 'severe hypoglycaemic event' including non-working period

Pilots with diabetes should be advised to cease pilotage duties if a severe hypoglycaemic event is experienced while working or at any other time. Such an event should result in a Triggered Health Assessment. The pilot should be classed Temporarily Unfit for Duty and not work for a significant period of time. The **minimum period** of time before returning to pilotage is **generally 6 weeks** because it often takes many weeks for patterns of glucose control and behaviour to be re-established and for any temporary 'lack of hypoglycaemia awareness' to resolve. The non-working period will depend on factors such as identifying the reason for the episode, specialist opinion and the nature of the work. Specialist support of a return to pilotage should be based on patient behaviour and objective measures of glycaemic control (documented blood glucose) over a reasonable time interval.

Reducing the risk of hypoglycaemia: advice to pilots

Pilots with diabetes should be advised to take appropriate precautionary steps to help avoid a severe hypoglycaemic event; for example by:

- complying with specified medical review requirements (general practitioner or specialist);
- not working if their blood glucose is less than 5 mmol/L;
- not working for more than 2 hours without considering having a snack;
- not delaying or missing a main meal;
- self-monitoring blood glucose levels before working and every few hours at work, as reasonably practical, taking into account the history of control;
- carrying adequate glucose for self-treatment;
- treating mild hypoglycaemia if symptoms occur while working, including;
    - ceasing work as practical;
    - self-treating the low blood glucose;
    - checking the blood glucose levels 15 minutes or more after the hypoglycaemia has been treated and ensuring it is above 5 mmol/L; and
    - not recommencing working until feeling well and until at least 30 minutes after the blood glucose is above 5 mmol/L.

Pilots should be instructed to request a Triggered Health Assessment if their condition deteriorates or their treatment changes.

Lack of hypoglycaemia awareness (syn Reduced awareness of hypoglycaemia)

Lack of hypoglycaemia awareness exists when a person does not regularly sense the usual early warning symptoms of mild hypoglycaemia, such as sweating, tremulousness, hunger, tingling around the mouth, palpitations and headache. Lack of hypoglycaemia awareness should be considered in people with insulin-treated diabetes of longer duration (more than 10 years), particularly if there is a history of unstable glucose control or severe hypoglycaemia over recent years. It may be screened for using the Clark Questionnaire shown in Figure 19.

When lack of hypoglycaemia awareness develops in a person who has experienced a severe hypoglycaemic event, it may improve in the subsequent weeks and months if further hypoglycaemia can be avoided.

A person with a lack of hypoglycaemia awareness should be under the regular care of a medical practitioner with expert knowledge in managing diabetes (e.g. endocrinologist or diabetes specialist), who should be involved in assessing their fitness for duty. Any pilot who has a lack of hypoglycaemia awareness is generally not fit for duty unless their ability to experience early warning symptoms returns.

In managing lack of hypoglycaemic awareness, the treating medical practitioner should focus on aspects of the person's self-care to minimise a severe hypoglycaemic event occurring while working, including the points described in the section, 'Reducing the risk of hypoglycaemia: advice to pilots' (see above). In addition, self-care behaviours that help to minimise severe hypoglycaemic events in general should be a major ongoing focus of regular diabetes care. This requires attention by both the treating medical practitioner and the person with diabetes to diet and exercise programs, insulin regimens and blood glucose testing protocols.

18.2.5 Acute hyperglycaemia

Although acute hyperglycaemia may affect some aspects of brain function, there is insufficient evidence to determine regular effects on work performance. Each person with diabetes should be counselled about management of their diabetes during days when they are unwell, and should be advised not to work if they are acutely unwell with metabolically unstable diabetes.

18.2.6 Electromagnetic interference

Pilots using insulin pumps or other electronic devices should have their devices assessed for sensitivity to electromagnetic fields (e.g. static, extremely low frequency or radiofrequency) that are likely to be present in the work environment and may cause interference with the device.

18.2.7 Comorbidities and end-organ complications

Assessment and management of comorbidities is an important aspect of managing pilots with diabetes with respect to their fitness for pilotage. This includes but is not limited to the following.

Vision (refer to Section 26 Vision and eye disorders)

Visual acuity should be tested annually. Retinal screening should be undertaken every second year if there is no retinopathy, or more frequently if at high risk. Visual field testing is not required unless clinically indicated.

Neuropathy and foot care

Although it can be difficult to be prescriptive about neuropathy in the context of pilotage, it is important that the severity of the condition is assessed. Adequate sensation and movement is required for climbing the pilots' ladder and stairs on a ship and so on (refer to Sections 21 Neurological conditions and 20 Musculoskeletal disorders).

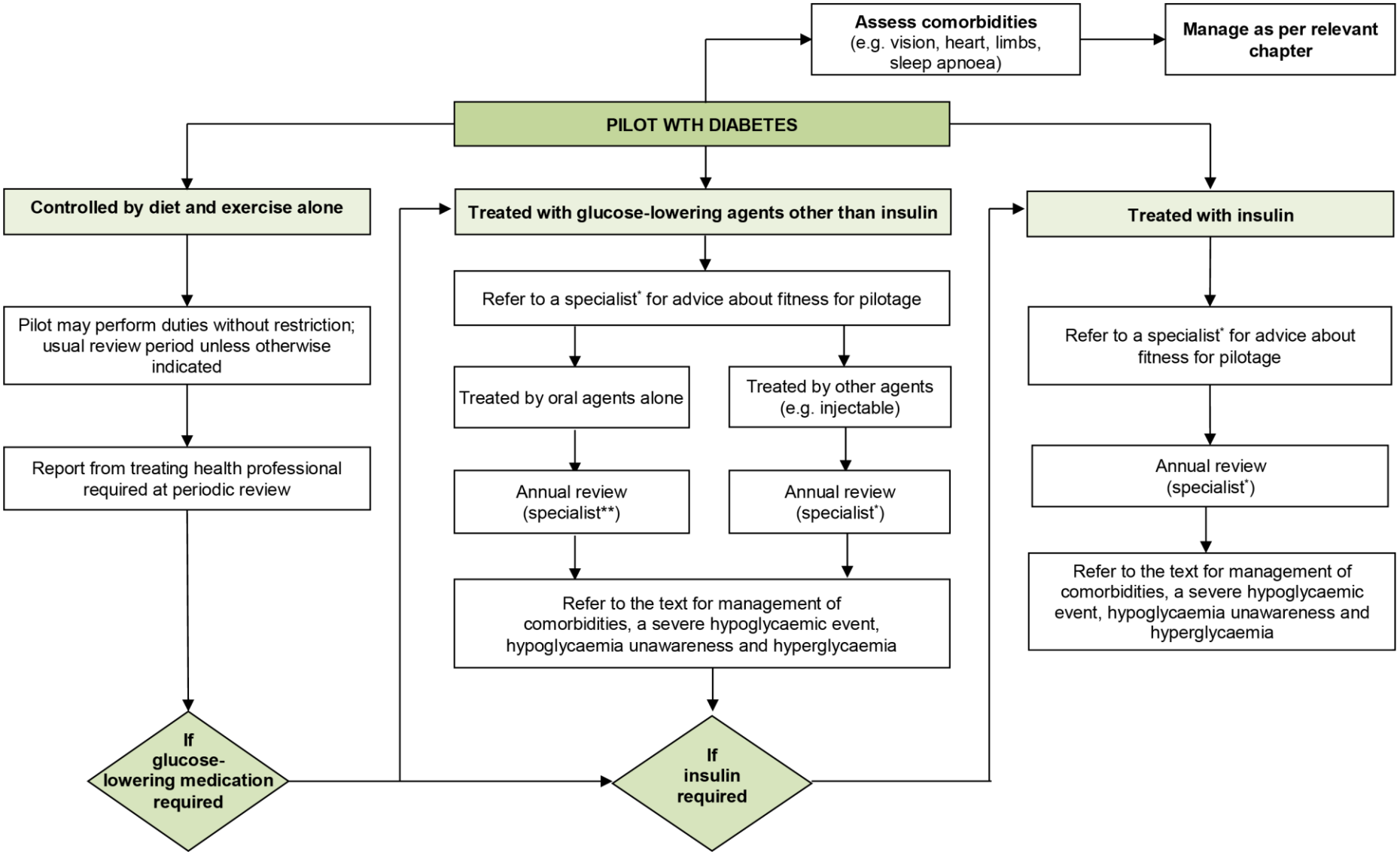
Sleep apnoea

Sleep apnoea is a common comorbidity affecting many people with type 2 diabetes and has substantial implications for safety. Raised BMI (35 or greater) is a strong predictor of sleep apnoea (refer to Section 24 Sleep disorders).

Cardiovascular

Diabetes is an important risk factor in assessing the cardiac risk level (refer to Section 17 Cardiovascular fitness and diseases).

Figure 18 Management of diabetes



*Endocrinologist or diabetes specialist

** Review is by specialist. If well controlled, may be reviewed by treating doctor with agreement of the specialist

Figure 19 Clarke hypoglycaemia awareness survey[18]

The survey is useful to administer to assess hypoglycaemia awareness including: For people who have been on insulin for many years; after a severe hypoglcycaemic event and after an incident

SCORING

- Four or more 'R' responses implies reduced awareness
- For Question 5 and 6, one 'R' response is given if the answer to question 5 is less than the answer to question 6.
- 'A' responses imply awareness
- 'U' response (12 or more severe hypoglycaemic episodes in the last 12 months) indicates unawareness.

1. Check the category that best describes you: (check one only)
   - ☐ I always have symptoms when my blood sugar is low (A)
   - ☐ I sometimes have symptoms when my blood sugar is low (R)
   - ☐ I no longer have symptoms when my blood sugar is low (R)
2. Have you lost some of the symptoms that used to occur when your blood sugar was low?
   - ☐ Yes (R) ☐ No (A)
3. In the past six months how often have you had moderate hypoglycaemia episodes? (Episodes where you might feel confused, disoriented, or lethargic and were unable to treat yourself)
   - ☐ Never (A)
   - ☐ Once a month (R)
   - ☐ Once or twice (R)
   - ☐ More than once a month (R)
   - ☐ Every other month (R)
4. In the past year how often have you had severe hypoglycaemic episodes? (Episodes where you were unconscious or had a seizure and needed glucagon or intravenous glucose)
   - ☐ Never (A) ☐ 3 times (R) ☐ 7 times (R) ☐ 10 times (R)
   - ☐ 1 time (R) ☐ 5 times (R) ☐ 8 times (R) ☐ 11 times (R)
   - ☐ 2 times (R) ☐ 6 times (R) ☐ 9 times (R) ☐ 12 or more times (U)
5. How often in the last month have you had readings <3.8mmol/L with symptoms?
   - ☐ Never
   - ☐ 2 to 3 times/week
   - ☐ 1 to 3 times
   - ☐ 4 to 5 times/week
   - ☐ 1 time/week
   - ☐ Almost daily
6. How often in the last month have you had readings <3.8mmol/L without any symptoms?
   - ☐ Never
   - ☐ 2 to 3 times/week
   - ☐ 1 to 3 times
   - ☐ 4 to 5 times/week
   - ☐ 1 time/week
   - ☐ Almost daily

(R = answer to 5 < answer to 6, A = answer to 5 ≥ answer to 6)

7. How low does your blood sugar need to go before you feel symptoms?
   - ☐ 3.3-3.8mmol/L (A)
   - ☐ 2.2 – 2.7mmol/L (R)
   - ☐ 2.7-3.3mmol/L (A)
   - ☐ <2.2mmol/L (R)
8. To what extent can you tell by your symptoms that your blood sugar is low?
   - ☐ Never (R)
   - ☐ Often (A)
   - ☐ Rarely (R)
   - ☐ Always (A)
   - ☐ Sometimes (R)

Note: Units of measure have been converted from g/dl to mmol/L as per http://www.onlineconversion.com/blood_sugar.htm.

[18] Clarke W, et al. Reduced awareness of hypoglycemia in adults with IDDM. Diabetes Care. 1995;18(4):517-22

18.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 10.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 10 Medical criteria for marine pilots – Diabetes

Table10 Medical criteria for marine pilots – Diabetes	
Condition	**Criteria**
Screening for diabetes	Diabetes may be diagnosed on history or on HbA1c testing or on fasting or random blood glucose. • If HbA1c is equal to or greater than 53 mmol/mol (7.0%) regard as diabetic. • If HbA1c is 48 mmol/mol (6.5%) or greater but less than 53 mmol/mol (7.0%) arrange a repeat (confirmatory) test. - If repeat HbA1c is 48 mmol/mol (6.5%) or greater, diagnosis of diabetes is confirmed. - If repeat test is not raised, regard as non-diabetic and review as per normal periodic schedule. • If initial test is less than 48 mmol/mol (6.5%), regard as non-diabetic and review as per normal periodic schedule.
Diabetes controlled by diet and exercise alone	A pilot with diabetes controlled by diet and exercise alone may perform pilotage without restriction. More frequent reviews may not be necessary. They should be reviewed by their treating doctor periodically regarding progression of diabetes. A report from the treating doctor should be available for review by the Authorised Health Professional at Periodic Health Assessment appointments. The pilot should be instructed to request a Triggered Health Assessment if their condition deteriorates or their treatment changes.
Diabetes treated by glucose-lowering agents other than insulin (oral agents and other agents e.g. injectable agents)	A pilot is not Fit for Duty Unconditional: • if the pilot has non-insulin-treated diabetes mellitus and is being treated with glucose-lowering agents other than insulin. Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and information provided by a specialist (endocrinologist / consultant physician specialising in diabetes) on whether the following criteria are met: • the condition is satisfactorily controlled (refer to Section 18.2.2 Satisfactory control of diabetes) and the person is compliant with treatment; and • there is no history of a severe hypoglycaemic event during recent years as assessed by the specialist; and • the pilot experiences early warning symptoms (awareness) of hypoglycaemia (refer to Section 18.2.2 Satisfactory control of diabetes); and

Table10 Medical criteria for marine pilots – Diabetes	
Condition	**Criteria**
	• the pilot is following a treatment regimen that minimises the risk of hypoglycaemia; and • there is an absence of end-organ effects that may affect working as per this Standard. *For pilots treated by oral agents, the Authorised Health Professional may determine that review by the pilot's treating general practitioner is sufficient if there is an established pattern of compliance and good response to treatment, and this is agreed by the specialist. The initial granting of Fit for Duty Subject to Review must be based on information provided by a specialist (endocrinologist / consultant physician specialising in diabetes).
Insulin-treated diabetes	A pilot is not Fit for Duty Unconditional: • if the pilot has insulin-treated diabetes. Fit for Duty Subject to Review may be determined taking into account the nature of the work and information provided by a specialist in endocrinology or diabetes on whether the following criteria are met, subject to at least annual review: • the condition is satisfactorily controlled (refer to Section 18.2.2 Satisfactory control of diabetes) and the person is adherent with treatment; and • there is no history of a severe hypoglycaemic event during recent years as assessed by the specialist; and • the pilot experiences early warning symptoms (awareness) of hypoglycaemia (refer to Section 18.2.2 Satisfactory control of diabetes); and • the pilot is following a treatment regimen that minimises the risk of hypoglycaemia; and • there is an absence of end-organ effects that may affect working as per this Standard.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

References and further reading

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19 Hearing

19.1 Relevance to marine pilots

Hearing is critical to the pilot's work. It is intrinsic to bridge management, which requires open communication with bridge officers including closed-loop communication for confirmation of orders which offers safety in redundancy. The bridge is relatively quiet but open wings may be noisy when a sheltered place is needed to be found to use radio-communication.

There is extensive use of hand-held radios for communication with tugs, line boats, harbour control, etc. again using closed-loop communication. Most hand-held radios can be amplified to help hearing in the case of poor reception. The pilot may need to hear voice (on the bridge) and radio inputs from various parties at the same time.

When descending the pilot's ladder the pilot needs to communicate with the crewman on the cutter. This may be by voice or hand signals in bad weather.

Closed loop communication by its redundancy contributes to safety on the bridge, and similarly the use of hand signals in adverse weather provides redundancy in communication on the ladder. Therefore some degree of hearing loss requiring hearing aids may be permissible subject to meeting certain requirements.

19.2 Noise exposure

Pilots who are transferred by helicopter are noise exposed. It is crucial their hearing is protected for the reasons given above regarding doing their job. If the daily averaged noise exposure is excessive they also need to be managed as per SafeWork NSW regulations. However, the conduct of audiometry for hearing required to meet this Standard is not to be confused with any audiometry required for compliance with noise regulations.

19.3 General assessment and management guidelines

19.3.1 Screening and initial assessment

Pilots should be screened by pure tone audiometry at 0.5, 1.0, 2.0, and 3.0 kHz as per Australian Standard AS/ISO 8253:2009 Parts 1-3. The assessment of hearing loss should be conducted at each of these frequencies individually (not averaged).

Hearing levels do not meet the requirements for marine pilotage if the hearing loss is ≥ 40 dBA at 0.5, 1.0, 2.0 or 3.0 KHz in either ear. Hearing aids should not be worn during initial pure tone audiometry.

All those who fail screening audiometry must be referred to an audiologist* or ENT specialist for a more detailed audiological evaluation. This evaluation should involve:

- diagnostic test of hearing sensitivity;
- conduct of a speech in quiet test according to the protocol shown in Figure 20;
- an evaluation of whether hearing aids would enable the pilot to meet the Standard; and
- an assessment of whether the aids are suitable for work in the pilotage environment.

If the pilot passes the speech discrimination in quiet test they may be classed Fit Subject to Review and any hearing loss monitored. The frequency of review will be determined by the progressiveness of the underlying pathology.

*An audiologist should be a member of the Audiological Society of Australia Inc. (ASA). Contacts of members are available at www.audiology.asn.au.

Figure 20 Speech discrimination in quiet test

Speech discrimination in quiet test

Speech discrimination in quiet is assessed using phonemically balanced monosyllabic word lists (PBMs). These are 25-word lists, plus 5 practice items.

- As the work environment involves binaural listening to speech in quiet, the test should be binaural free-field PBMs.
- The presentation level should be 70 dB via a calibrated single speaker stationed at 0 degrees azimuth with the candidate seated at approximately one metre from the speaker.
- Scoring for PBMs is calculated as: score equals the percentage words correctly identified, excluding practice items. Therefore, the number of words correct multiplied by 4 equals the percentage correct.
- A pass score should be set at 70% of words accurately identified.

PBM and PBN wordlists are available on CD from the National Acoustic Laboratories, 126 Greville St, Chatswood NSW, 2067 (product number P4747, cost $57.00).

19.3.2 Hearing aids

Pilots with hearing aids should undergo routine audiometry as above (without hearing aids) and should be routinely assessed using the speech in quiet test. If they pass they may be categorised Fit Subject to Review and their hearing and hearing aid should be assessed at least annually.

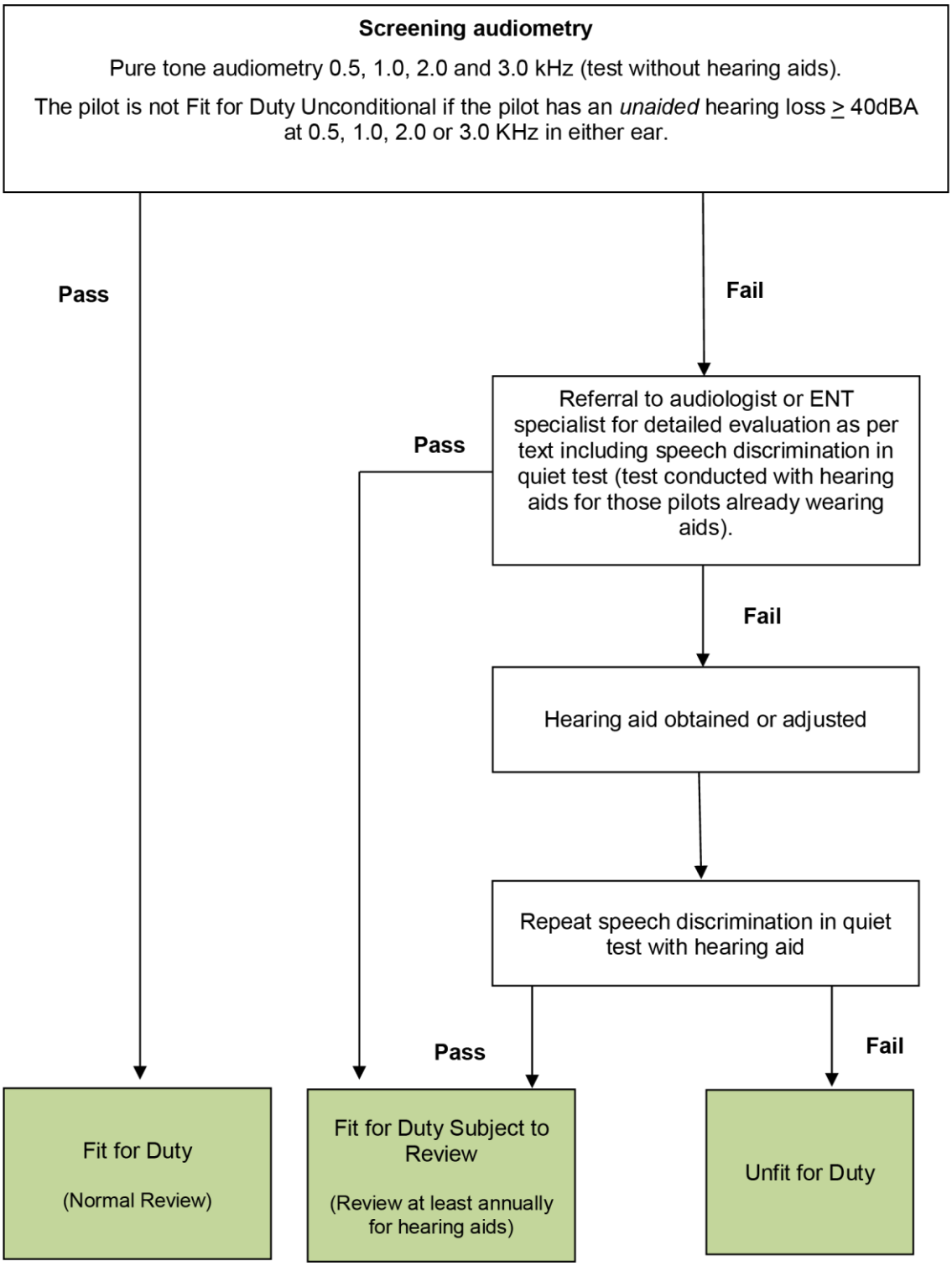
Pilots who use hearing aids should be advised of the following requirements:

- the aids should always be worn on the bridge, although aids may be removed when on the ladder to avoid wetting;
- they must be worn at the recommended settings;
- the pilot should carry a supply of batteries;
- the aids must be self-contained and fit within or behind the ear;
- they should report the development of any medical condition that may temporarily reduce efficient function of the hearing aid (e.g. ear infection, wax build-up), or if a hearing aid fails or is lost;
- they should have the hearing aid serviced annually;
- in the event of replacement or upgrading of hearing aids, or further deterioration in hearing, speech discrimination in quiet should be re-examined (Triggered Health Assessment).

19.3.3 Cochlear implants

Pilots with a cochlear implant will generally have difficulty with speech recognition in background noise. Cochlear implants generally should not be used in marine piloting. Exemptions may be made by an ear nose and throat (ENT) specialist or audiologist based on careful consideration of the job requirements in relation to the type of cochlear implant.

Figure 21 Hearing assessment for marine pilots



19.4 Medical criteria

Medical criteria for fitness for duty are outlined in Table 11. This Standard assumes closed-loop communication is practised.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a pilot's fitness for duty.

Table 11 Medical criteria for marine pilots – Hearing

Table 11	**Medical criteria for marine pilots – Hearing**
CONDITION	**CRITERIA**
Hearing	Compliance with the Standard should be initially assessed by audiometry without hearing aids or use of a cochlear implant. A pilot is not Fit for Duty Unconditional: • if the pilot has an *unaided* hearing loss ≥ 40 dBA at 0.5, 1.0, 2.0 or 3.0 KHz in either ear. ***Pilots without hearing aids*** Fit for Duty Subject to Review may be determined if the pilot passes a speech discrimination in quiet hearing test (refer Figure 21). The frequency of review will be determined by the progressiveness of the underlying pathology. ***Pilots with hearing aids*** Fit for Duty Subject to Review may be recommended if the pilot uses a hearing aid and passes a speech discrimination in quiet hearing test (see text). They should be reviewed at least annually. They should also be judged Fit for Duty Conditional upon wearing the hearing aid. Cochlear implants are generally not acceptable.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

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20 Musculoskeletal conditions (including BMI)

See also Section 20.2.5 Balance.

20.1 Relevance to marine pilots

Pilots need to embark and disembark ships using the pilot's ladder as detailed in Table 5. The ladder is up to 9 metres long and requires a vertical ascent or descent often in adverse weather conditions. Marine pilots therefore require soundness of limbs, neck, back and good balance.

The work requires considerable musculoskeletal fitness and is prone to accidents. The injury and medical retirement data for Sydney pilots illustrates the risks. Over the three-year period 2002/03 there were 27 injuries sustained, eight of which incurred lost time. Twelve affected the upper limb, four the lower limb, three both upper and lower limbs, seven affected neck and/or back and one was unspecified. The causes of nearly all injuries were associated with the pilot's ladder. There were two cases of medical retirement: one was due to rotator cuff (shoulder) and elbow injuries; the other followed a cervical fusion (neck), which resulted in inability to look down to judge landing on the cutter safely.

Pilots, at present, are recruited from senior ships officers and have prior experience of ships ladders and heights.

Body Mass Index (BMI - (weight / height^2) is also an important aspect of fitness for pilotage work. Excessive body mass (weight) places excessive strain on the musculoskeletal and cardiorespiratory systems when climbing/descending the pilot's ladder and predisposes to injury. Excessive abdominal girth also causes the pilot's centre of gravity to move away from the ladder increasing musculoskeletal strain. Excessive body mass also places extra load on the crewman on the cutter assisting the pilot on/off the ladder. An abdominal circumference of greater than 94 cm in a male and 80 cm in a female indicates central obesity. Excessive BMI is also a risk factor for sleep apnoea (refer to Section 24 Sleep Disorders) and diabetes.

20.2 General assessment and management guidelines

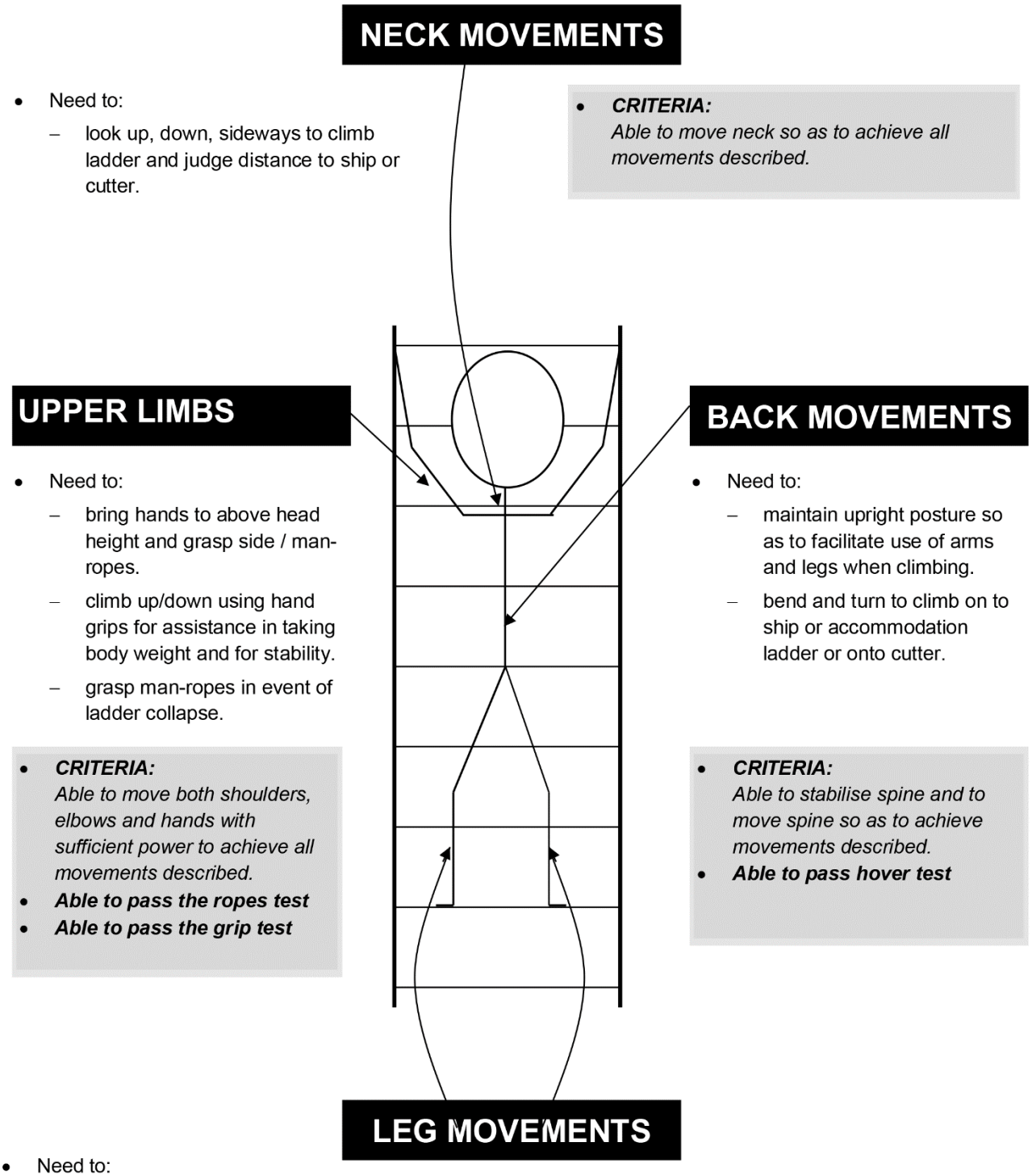
20.2.1 Musculoskeletal assessment

The aim of a health assessment is to detect those marine pilots who may have difficulty in performing their duties, and to identify those pilots who would benefit from remedial exercises or functional restoration, or job modification where helicopters are an option.

The examination primarily assesses functionality needed for climbing up and down the pilot's ladder (refer to Figure 22).

Where an abnormality is found a more focused examination (and any necessary investigation/referral) is needed to define the anatomical basis and implications for employment.

Figure 22 Musculoskeletal system: inherent requirements and medical criteria for climbing up or down pilot's ladder



The musculoskeletal assessment features the following:

- identification of any scars, abnormalities or deformities which may prevent or limit marine pilot duties;
- assessment of neck rotation, flexion and extension;
- assessment of grip strength using a Jamar (or equivalent) grip test (refer to table of norms). This test should be conducted before the ropes test to ensure safety in conducting the latter test. Adequate grip strength is greater than or equal to the 50th percentile for age and sex in each hand (refer Figure 23).
- assessment of upper limb movement, grip strength and upper body strength in relation to gross body mass, using the ropes test (refer Figure 24).
- assessment of back rotation, flexion and extension including the Bridge (hover) test (Figure 25);
- assessment of lower limb movement including ability to perform the step test for VO_2 submax (refer Section 17.2.2 Cardiorespiratory fitness $V0_2$max).

The examination is guided by content of the Health Assessment Clinical Record Form (Green Form) (refer to Appendix 1).

All information should be integrated and considered in assessing musculoskeletal fitness and making a final conclusion about fitness for duty. In some cases a functional assessment of a pilot by an occupational therapist may be helpful. Sydney and Newcastle have pilot's ladders rigged-up on land, which may be used in return to work assessments noting they do not simulate the roll and pitch of a ship and the cutter.

Where there is an amputation it should be assessed on functional merits. Where a prosthesis is worn this should be similarly assessed.

It may be assumed that if a pilot is fit enough to climb ladders they are fit enough for other tasks requiring musculoskeletal capacity such as walking around the bridge or climbing ladders and gangways on wharves at port.

Where a lack of musculoskeletal fitness is found at examination, advice may be given regarding appropriate remedial activity or referral made to an exercise physiologist, sports physician or other suitable practitioner, in conjunction with the pilot's general practitioner. Pilots should also be encouraged to maintain musculoskeletal fitness through an activity of their choice e.g. gym, swimming, cycling, etc.

Figure 23 Protocol and normative data for hand grip strength (in kg) (Australian fitness norms)

Grip Strength test (Jamar)

- Set the Jamar at a distance to approximate the diameter of the man-rope (28mm) plus thin gloves (~30mm).
- Ask the pilot to complete the test with is alternate hands for 3 readings on each hand.
- Average the readings for each hand
- Compare the strength in kg to the table of norms below
- Pilots should be ≥50th percentile for age in each hand.

Percentile	Hand grip strength(kg) by age range				
	18-29	30-39	40-49	50-59	60-69
Percentile – MEN					
5	34	40	38	36	32
25	42	46	44	43	37
50	50	51	49	47	41
75	56	57	55	51	46
95	65	66	61	60	52
Percentile – WOMEN					
5	24	23	23	19	18
25	29	28	27	25	23
50	30	31	30	29	25
75	34	35	33	32	28
95	39	40	38	36	34

Patient should be =>50th percentile for age in each hand.

Source: Gore, C.J. and Edwards, D. A. (Eds)(1992) 'Australian Fitness Norms: A manual for fitness assessors.' *The Health Development Foundation* North Adelaide SA.

Figure 24 Ropes test for upper body strength and grip strength[19]

Test protocol

The pilot stands on a set of scales with man ropes (28mm diameter and 50cm apart) extended vertically above.

Their weight is recorded at this starting position. The value for 40% of this is calculated and recorded on the Green Form.

The pilot grips the ropes bare-handed with both hands in a manner they deem comfortable.

Maintaining contact with the scales, the pilot creates a pull-down force, thus reducing their body weight on the scales.

They should be asked to take as much of their weight as possible through the man ropes without losing contact with the scales.

They should be asked to hold this weight for six (6) seconds.

Interpretation of results

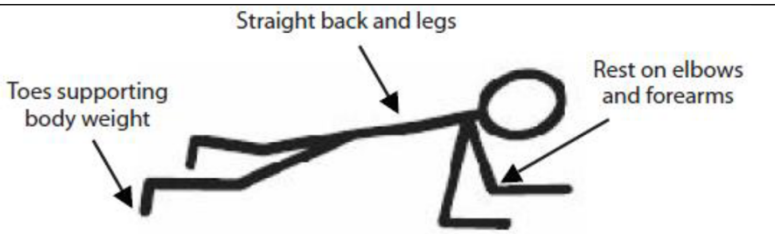
Adequate performance of the test is when the pilot is able to take **60% or more** of their body weight through the man ropes for **six (6) seconds**. That is, the scales indicate ≤40% of the pilot's full weight.

If the pilot is unable to hold >**40% of their body weight** for six seconds, they should be considered unfit to use the pilot ladder and should be referred for diagnostic assessment and/or strength training.

Categorisation of the pilot who can hold between **41% and 59%** of their body weight for six seconds**,** will depend on consideration of the full musculoskeletal assessment. They should also be referred for diagnostic assessment and/or strength training.

[19] Harden M, O,Neill D. Site Visit Report – Marine pilot fixed ladder Newcastle Pilot Station Dec 2016

Figure 25 Hover test



The pilot should be able to hold the position shown for **60 seconds** in order to demonstrate adequate back strength.

20.2.2 Body Mass Index

Height and weight should be measured and BMI calculated using the nomogram (Figure 26). Some allowance should be made for body composition because very muscular persons may have a high BMI but will be fit and at low risk on the ladder.

The BMI of pilots should be progressively tracked at Periodic Health Assessments to encourage maintenance of BMI and early detection of untoward trends. Where an untoward trend is detected, possible reasons should be assessed and appropriate advice given or referral made, e.g. for dietetic advice, in discussion with the pilot's general practitioner.

- If the BMI is greater than 30 (obese) the pilot should be categorised Fit Subject to Review and managed appropriately.
- If the BMI is greater than or equal to 35, the pilot should be categorised Temporarily Unfit for Duty until the BMI is reduced to satisfactory levels. However, if they are able to pass the ropes test (Figure 26) they may be categorised Fit Subject to Review.
- **Note that a BMI of 35 or greater will also trigger referral for assessment for sleep disorder** (refer to Section 24 Sleep Disorders).

20.2.3 Arthritis

Painful joints may arise due to inflammatory or degenerative arthritis. Pilots who have persistent pain and marked reduction in range of movement in shoulders, elbows, wrists, hands, hips, knees, ankles or feet may not meet the criteria.

The long term use of opioid analgesics is generally not accepted as an appropriate approach for chronic musculoskeletal pain management and therefore should be questioned. Pilots using these agents should be referred for assessment by an appropriate specialist such as an orthopaedic surgeon or rheumatologist or if appropriate an addiction medicine specialist or addiction psychiatrist.

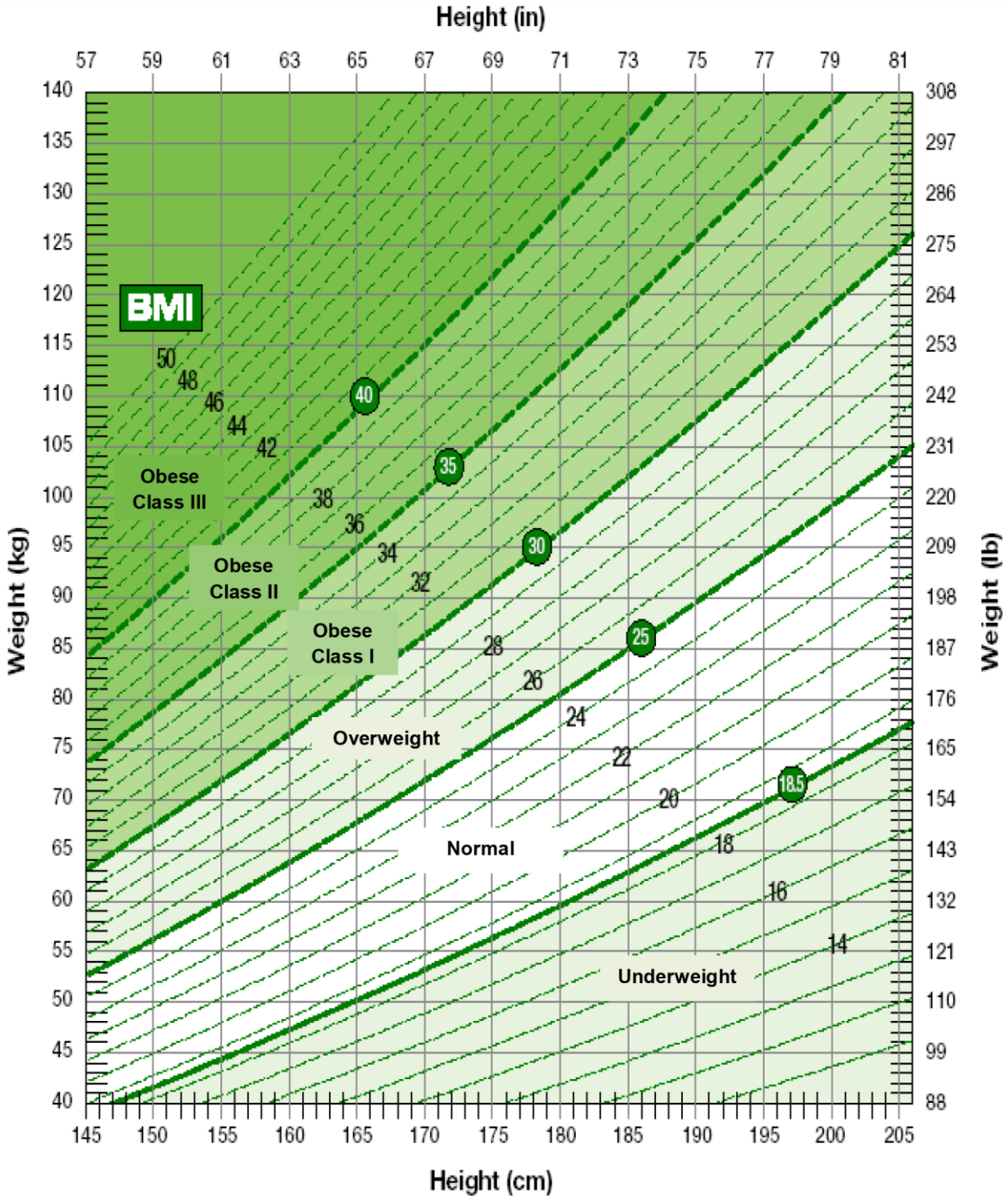
20.2.4 Post surgery including joint replacement

Pilots should generally not pilot a ship for six weeks post major orthopaedic surgery. They should then be fully assessed regarding all criteria including practical assessment on a pilot's ladder on land.

20.2.5 Balance

Agility of movement requires good balance which is assessed using the Romberg test (refer also Section 21.3 Balance and vestibular disorders).

Figure 26 Body Mass Index (BMI) nomogram



20.3 Medical criteria

Medical criteria are outlined in Table 12. The musculoskeletal activities required for marine piloting are described in Figure 22.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a pilot's fitness for duty.

Table 12 Medical criteria for marine pilots – Musculoskeletal conditions

Table 12	**Medical criteria for marine pilots – Musculoskeletal conditions**
CONDITION	**CRITERIA**
Musculoskeletal conditions	The musculoskeletal activities required for marine piloting are described in Figure 22. A pilot is not Fit for Duty Unconditional: • if the pilot is unable to adequately perform the inherent requirements as assessed by the clinical examination and specific tests for: ○ neck movement; ○ grip strength ≥ 50th percentile for age and sex in each hand (Figure 23); ○ upper limbs (including the ropes test – refer to Figure 24); ○ lower limbs (including step test); ○ back and core body strength (including hover test, Figure 25) Fit for Duty Subject to Review or Subject to Job Modification or Temporarily Unfit may be determined taking into account the ability to undertake the specific tests required (refer text and Green Form) and the opinion of a specialist or therapist and response to treatment and/or strength training.
BMI	If the BMI is > 30 (obese) the pilot should be categorised Fit Subject to Review and managed appropriately. If the BMI is ≥ 35 the pilot should be categorised Temporarily Unfit until the BMI is reduced to satisfactory levels. However, if they are able to pass the ropes test they may be categorised Fit Subject to Review. (Refer also to text and Section 24 Sleep Disorders)

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

References

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Harden M, O,Neill D. Site Visit Report – Marine pilot fixed ladder, Newcastle Pilot Station. Dec 2016

Palmer K, Greenough C. Spinal disorders. Chapter 11 in Fitness for Work; Eds: Palmer K, Cox R and Brown I. Oxford University Press. 2007

Pollack KM, Sorock GS, Slade MD, Cantley L, Sircar K, Taiwo O, Cullen MR. Association between Body Mass Index and Acute Traumatic Workplace Injury in Hourly Manufacturing Employees. American Journal of Epidemiology. 2007

21 Neurological conditions

Pilotage requires a number of intact neurological functions including the following:

- visuospatial perception;
- insight;
- judgement and appropriate response in emergency situations;
- cognitive skills including attention and concentration;
- communication skills including teamwork;
- reaction time;
- memory;
- sensation;
- muscle power (refer to Section 20 Musculoskeletal conditions);
- coordination;
- balance; and
- vision (refer to Section 26 Vision and eye disorders).

Impairment of any of these capacities may be caused by neurological disorders and thus affect safe working ability. In addition to these deficits, some neurological conditions produce seizures. This section provides guidance and medical criteria for the following conditions:

- dementia (refer to Section 21.1 Dementia);
- seizures and epilepsy (refer to Section 21.2 Seizures and epilepsy);
- vestibular disorders (refer to Section 21.3 Balance and vestibular disorders);
- other neurological conditions, including (refer to Section 21.4 other neurological conditions);
    - unruptured intracranial aneurysms and other vascular malformations
    - cerebral palsy
    - head injury
    - neuromuscular conditions
    - Parkinson's disease
    - multiple sclerosis
    - stroke
    - transient ischaemic attacks
    - subarachnoid haemorrhage
    - space-occupying lesions, including brain tumours
    - neurodevelopmental disorders.

The focus of this section is mainly on long-term or progressive disorders affecting safe working ability, but some guidance is also provided regarding short-term fitness to work—for example, following head injury and vertigo (also refer to Section 15.3 Temporary illnesses).
Where pilots also experience musculoskeletal, visual or psychological symptoms, the relevant standards should also be considered. Refer to Sections 20 Musculoskeletal conditions, Section 22 Psychiatric conditions and Section 26 Vision and eye disorders.

21.1 Dementia

This section focuses on dementia, which for the purposes of this Standard, is defined as a progressive deterioration of cognitive function due to degenerative conditions of the central nervous system.

Other causes of fluctuating or permanent cognitive impairment or delirium, such as hepatic, renal or respiratory failure, may be managed according to general principles. Substance misuse is covered in Section 25 Substance misuse and dependence.

21.1.1 Relevance to marine pilots

Dementia is characterised by significant loss of cognitive abilities such as memory capacity, psychomotor abilities, attention, visuospatial functions and executive functions. This Standard is therefore applicable to pilots who have high cognitive demands.

Dementia may arise due to numerous causes including Alzheimer's disease, Huntington's disease, fronto-temporal dementia and vascular dementia. Alzheimer's disease is the most common cause, accounting for 50–70% of cases. It mainly affects people over the age of 70, and is of some relevance in the maritime industry due to an ageing workforce.

Dementia may affect safe working ability in a number of ways, including:

- memory loss;
- limited concentration or 'gaps' in attention, such as failing to see or respond to signals errors in judgement;
- confusion when making choices;
- poor decision making or problem solving;
- poor insight and denial of deficits;
- errors with navigation, including forgetting details of routes;
- slowed reaction time; and
- poor hand–eye coordination.

21.1.2 General assessment and management guidelines

Assessment

Due to the progressive and irreversible nature of the condition, pilots with a diagnosis of dementia will eventually be a risk to themselves and others when working.

The level of impairment varies widely; each person will experience a different pattern and timing of impairment as their condition progresses. This presents problems in both diagnosis and management.

The following points may be of assistance in assessing a person:

- **Work history.** Have they been involved in any incidents? Have they been referred for assessment by an employer?
- **Vision.** Can they see things coming straight at them or from the sides? (refer to Section 26 Vision and eye disorders).

- **Hearing.** Can they hear speech and warning sounds?
- **Reaction time.** Can they respond to signals?
- **Problem solving.** Do they become upset and confused when more than one thing happens at the same time?
- **Coordination.** Have they become clumsy or started to walk differently because their coordination is affected?
- **Praxis**. Do they have difficulty using their hands and feet when asked to follow motor instructions?
- **Alertness and perception.** Are they aware and do they understand what is happening around them? Do they experience hallucinations or delusions?
- **Insight**. Are they aware of the effects of their dementia? Is there denial?

Because of the lack of insight and variable memory abilities associated with most dementia syndromes, the person may minimise or deny any difficulties with working. Work performance reports, and feedback from port authorities or co-pilots may be a useful source of information regarding overall coping and safety decision-making skills. Neuropsychological testing may be helpful to forming an overall opinion of fitness for duty. The ability to respond under stress may be assessed on a simulator or by other means.

21.1.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 13. Due to the progressive nature of dementia, a person first diagnosed with suspected dementia should be classed as Temporally Unfit and referred for specialist assessment. A pilot with a diagnosis of dementia will generally not meet this Standard. In some situations, a classification of Fit for Duty Subject to Review may be determined subject to careful assessment by an appropriate specialist. Information relating to work performance and, in particular, safety breaches or near misses, should also be considered.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 13 Medical criteria for marine pilots – Dementia

Table 13	**Medical criteria for marine pilots – Dementia**
Condition	**Criteria**
Dementia	A pilot is not Fit for Duty Unconditional: • if the pilot has a diagnosis of dementia. Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and work performance reports and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the psychological capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working, and • the pilot has the psychological capacities (visuospatial perception, judgement, attention, reaction time) for safe dis/embarkation using the pilots ladder.

21.2 Seizures and epilepsy

(Refer also to Section 16 Blackouts, Section 17 Cardiovascular fitness and diseases and Section 18 Diabetes)

21.2.1 Relevance to marine pilots

Effects of seizures on pilotage

Epilepsy refers to the tendency to experience recurrent seizures. Not all people who experience a seizure have epilepsy.

Seizures vary considerably, some being purely subjective experiences (e.g. some focal seizures), but the majority involve some impairment of consciousness (e.g. absence and complex partial seizures) or loss of voluntary control of the limbs (e.g. focal motor and complex partial seizures). Convulsive (tonic–clonic) seizures may be generalised from onset or secondarily generalised with focal onset. Seizures associated with loss of awareness, even if brief or subtle, or loss of motor control, have the potential to impair the ability to perform pilotage.

In addition, sleep deprivation is a common provoking factor in epilepsy and may be experienced in shift work.

Evidence of safety risk

Evidence of safety risk is derived from road crash data. Most studies have reported an elevated crash risk among drivers with epilepsy, but the size of the risk varies considerably across the studies. The majority of studies have found that individuals with epilepsy are twice as likely to be involved in a motor vehicle crash compared with the general driving population. More recent studies have found that drivers who do not take anti-epileptic medication as prescribed are at an increased risk for experiencing a crash[20].

21.2.2 General assessment and management guidelines

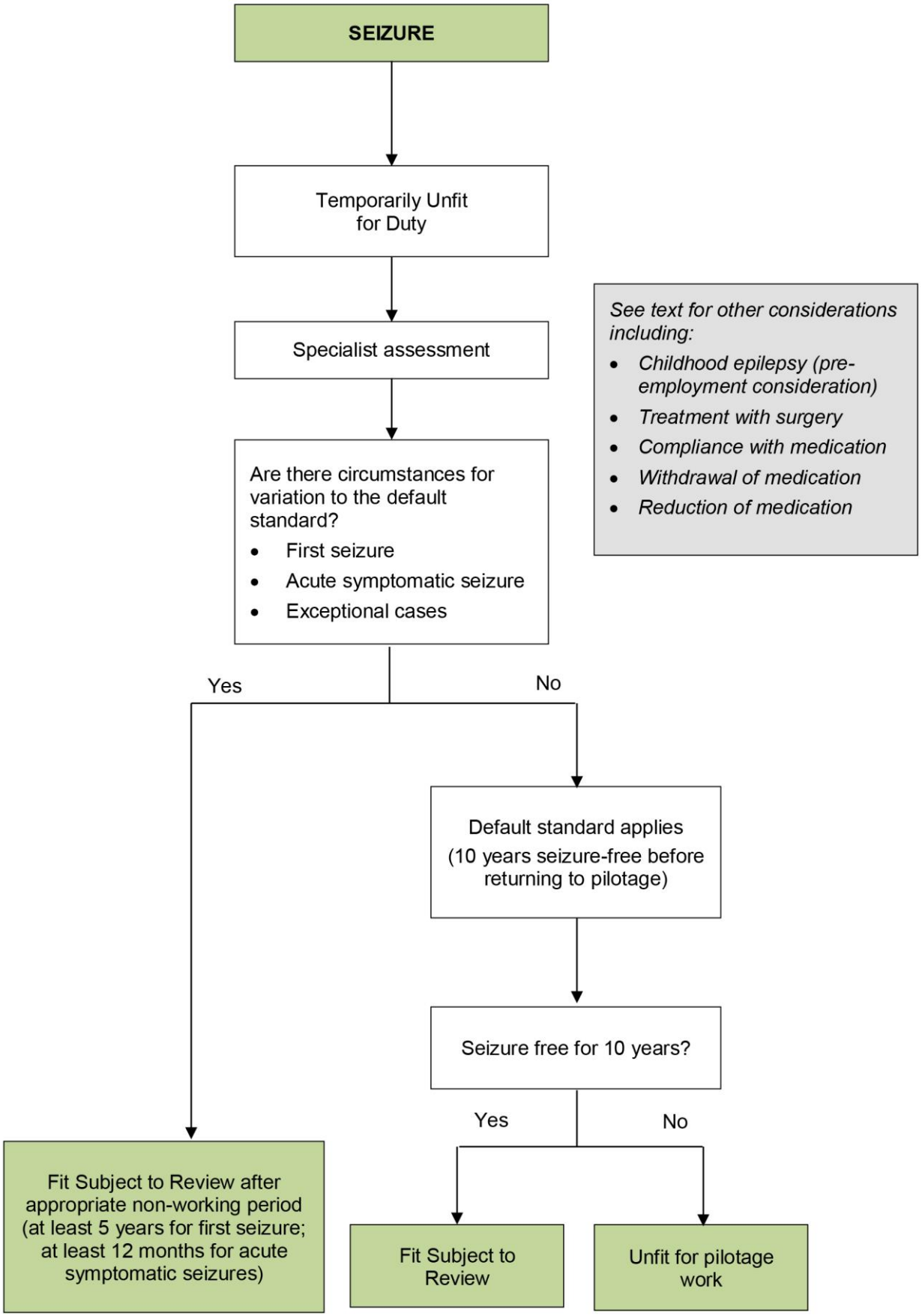
An overview of the management of pilots who have had a seizure is shown Figure 27.

Epilepsy is a common disorder with a cumulative incidence of 2% of the population, with 0.5% affected and taking medication at any one time. The majority of cases respond well to treatment, with a terminal remission rate of 80% or more. The majority suffer few seizures in a lifetime, and about half will have no further seizures in the first 1 or 2 years after starting treatment. Some people with epilepsy may eventually cease medication. For others, surgery may be beneficial.

Pilots experiencing initial seizures should be referred to a specialist for accurate diagnosis of the specific epilepsy syndrome so that appropriate treatment is instituted and all the risks associated with epilepsy, including pilotage, can be explained and acted upon.

[20] Charlton JL, et al. Influence of chronic illness on crash involvement of motor vehicle drivers, 2nd edn, Monash University Accident Research Centre, Melbourne. 2010 <http://monashuniversity.mobi/muarc/reports/muarc300.html>

Figure 27 Overview of management of pilots following seizure



The default standard (all cases)

Given the considerable variation in seizures and their potential impact on pilotage, a hierarchy of standards has been developed that provides a logical and fair basis for decision making regarding fitness for duty.

The 'default standard' is the standard that applies to all pilots who have had a seizure. It requires a seizure-free period of 10 years before return to pilotage. It applies in all but a number of defined situations that are associated with a lower risk of a seizure-related incident. Only in these situations may work be resumed after a shorter period of seizure freedom. However, the need for adherence to medical advice and at least annual review still apply.

If a seizure has caused an incident or near miss within the preceding 12 months, the required period of seizure freedom may not be reduced below that required under the default standard.

Anti-epileptic medication is not to be withdrawn in pilots (refer to Table 14 for details).

Variations to the default standard

There are some situations in which a variation to the default standard may be considered to allow an earlier return to pilotage. This will require input from a specialist in epilepsy. These situations include:

- **Seizures in childhood.** In some specific childhood epilepsy syndromes, seizures usually cease in the teenage years before working age. The pilots may be categorised as Fit for Duty Subject to Review if no seizures have occurred after 11 years of age. If a seizure has occurred after 11 years of age, the non-working periods apply as outlined in the table.
- **First seizure.** Approximately half of all people experiencing their first seizure will never have another seizure, whereas half will have further seizures (i.e. epilepsy). The risk of recurrence falls with time. Pilotage may be resumed after sufficient time has passed without further seizures (with or without medication) to allow the risk to reach an acceptably low level (refer to Table 14). If a second seizure occurs (except within 24 hours of the first), the risk of recurrence is much higher.
- **Acute symptomatic seizures.** Acute symptomatic seizures are caused by a transient brain disorder or metabolic disturbance (e.g. encephalitis, hyponatraemia, head injury, or drug or alcohol withdrawal) in patients without previous epilepsy. Acute symptomatic seizures can be followed by further seizures weeks, months or years after resolution of the transient brain disorder. This may occur because of permanent changes to the brain caused by the process underlying the acute symptomatic seizures (e.g. seizures may return years after a resolved episode of encephalitis) or because the transient brain disorder has recurred (e.g. benzodiazepine withdrawal).

  People who have experienced a seizure only during and because of a transient brain disorder or metabolic disturbance should not perform pilotage work for a sufficient period to allow the risk of recurrence to fall to an acceptably low level (refer to Table 14 for details). Return to pilotage requires input from a specialist in epilepsy. The risk of seizure recurrence varies greatly, depending on the cause.

  The management of seizures associated with hypoglycaemia is discussed in Section 18 Diabetes.

If seizures occur after the causative acute illness has resolved, whether or not due to a second transient brain disorder or metabolic disturbance, the acute symptomatic seizures standard no longer applies. For example, if a person has a seizure during an episode of encephalitis and then, after recovery from the encephalitis, has another seizure and begins treatment for epilepsy, the standard for epilepsy treated for the first time applies. Similarly, if a person experiences seizures during two separate episodes of benzodiazepine withdrawal, the default standard applies.

The management of late post traumatic epilepsy is discussed below under Head Injury (page 141).

- **Exceptional cases.** In addition to the reduction for particular circumstances or seizure types, there is also an allowance for 'exceptional cases' in which Fit for Duty Subject to Review may be considered for a pilot on the recommendation of a medical specialist with specific expertise in epilepsy, and in consultation with the Authorised Health Professional. This enables individualisation of cases where the person does not meet this Standard, but may be considered safe to perform their job.

Other situations relevant to pilots

- **Epilepsy treated by surgery**. Resection of epileptogenic brain tissue may eliminate seizures completely, allowing safe return to pilotage. However, this is unpredictable so the default non-working seizure-free period of 10 years applies. The vision standard may also apply if there is a residual visual field defect. If medication withdrawal is being considered, refer to 'Withdrawal of all anti-epileptic medication' (below).
- **'Safe' seizures (including prolonged aura).** Some seizures do not impair consciousness; however, this must be well established without exceptions and corroborated by reliable witnesses or video-electroencephalography (EEG) recording because people may believe their consciousness is unimpaired when it is not. For example, some 'auras' are associated with impaired consciousness that the person does not perceive.

  Seizures may begin with a subjective sensation (the 'aura') that precedes impairment of consciousness. If this lasts long enough, the person may have time to stop work. However, this can be relied upon only when this pattern has been well established without exceptions and corroborated by witnesses or video-EEG monitoring. Furthermore, it may be impractical to stop pilotage immediately and safely. For these reasons, such seizures require the application of the default non-working seizure-free period.
- **Sleep-only seizures**. Some seizures occur only in sleep. The default standard applies for pilots.
- **Seizure in a person whose epilepsy has been previously 'well controlled' including provoked seizures.** In people with epilepsy, their seizures are often provoked by factors such as sleep deprivation, missed doses of anti-epileptic medication, over-the-counter medications, alcohol or acute illnesses. If the provoking factor is avoided, the risk of subsequent seizures may be reduced. For pilots, the predisposing factors may not be reliably avoided, thus the default standard applies. Refer also to 'Medication noncompliance' (below).

- **Medication noncompliance**. Compliance with medical advice regarding medication intake is a requirement for fitness for duty. Where noncompliance with medication is suspected, the pilot may be required to have drug-level monitoring. Where a pilot with a history of compliance with medication experiences a seizure because of a missed dose and there were no seizures in the 12 months leading up to that seizure, the situation can be considered a provoked seizure (refer to standard for 'Seizure in a person whose epilepsy has been previously well controlled'). However generally, there is no reduction in the non-working period for pilots.
- **Withdrawal of all anti-epileptic medication**. Withdrawal of all anti-epileptic medication is incompatible with pilotage. This also applies to a reduction in dose of anti-epileptic medication except if the dose reduction is due only to the presence of dose-related side-effects, and the dose reduction is unlikely to result in a seizure.
- **Seizure causing an incident/near miss.** Not all seizures carry the same risk of causing an incident or near miss. People who have been involved in an incident/near miss within the preceding 12 months as a result of a seizure are likely to have a higher risk of further incidents. For a pilot who has experienced an incident as a result of a seizure, the default non-working seizure-free period applies, even if they fall into one of the categories that allow a reduction.
- **Concurrent conditions**. Where epilepsy is associated with other impairments or conditions, the relevant sections covering those disorders should also be consulted.
- **Other conditions with risk of seizure**. Seizures can occur in association with many brain disorders. Some of these disorders may also impair safe working because of an associated neurological deficit. Both the occurrence of seizures, as well as the effect of any neurological deficit must be taken into account when determining fitness for duty (refer to Section 21.4 Other neurological conditions).

Advice to pilots

All pilots with a history of seizure or epilepsy should be advised of the following general principles for safety if continuing pilotage:

- The pilot must continue to take anti-epileptic medication regularly when and as prescribed.
- The pilot should ensure they get adequate sleep and should not work when sleep deprived.
- The pilot should avoid circumstances or the use of substances (e.g. alcohol) that are known to increase the risk of seizures.

If a pilot refuses to follow a treating doctor's recommendation to take anti-epileptic medication, the pilot should be assessed as Unfit for Duty (refer also *Medication noncompliance* above).

21.2.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 14.

All pilots who need active management of a history of a seizure or epilepsy should be under review, including, where necessary, at least annual specialist appraisal. The use of an independent specialist may be considered.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 14 Medical criteria for marine pilots – Seizures and epilepsy

Table 14 Medical criteria for marine pilots – Seizures and epilepsy	
Condition	**Criteria**
All cases (default standard) Exceptions may be considered only if the situation matches one of those listed below.	A pilot is not Fit for Duty Unconditional: • if the pilot has experienced a seizure. Fit for Duty Subject to Review may be determined, subject to annual review, taking into account information provided by a specialist in epilepsy as to whether the following criteria are met: • there have been no seizures for at least 10 years; and • an EEG conducted in the last six months has shown no epileptiform activity and no other EEG conducted in the last 12 months has shown epileptiform activity; and • the pilot follows medical advice, including adherence to medication if prescribed or recommended.
History of a benign seizure or epilepsy syndrome limited to childhood (e.g. febrile seizures, benign focal epilepsy, childhood absence epilepsy)	A history of a benign seizure or epilepsy syndrome limited to childhood does not disqualify the person from being Fit for Duty, as long as there have been no seizures after 11 years of age. If a seizure has occurred after 11 years of age, there is no reduction and the default standard applies unless the situation matches one of those listed below.
First seizure Note: 2 or more seizures in a 24-hour period are considered a single seizure.	Fit for Duty Subject to Review may be determined, subject to annual review, taking into account information provided by a specialist in epilepsy as to whether the following criteria are met: • there have been no seizures for least 5 years (with or without medication); and • an EEG shows no epileptiform activity.
Acute symptomatic seizures Seizures occurring only during a temporary brain disorder or metabolic disturbance in a person without previous seizures. This includes head injuries, and withdrawal from drugs or alcohol. This is not the same as provoked seizures in a person with epilepsy.	Fit for Duty Subject to Review may be determined, subject to annual review, taking into account information provided by a specialist in epilepsy as to whether the following criteria are met: • there have been no further seizures for at least 12 months; and • an EEG conducted in the last six months has shown no epileptiform activity and no other EEG conducted in the last 12 months has shown epileptiform activity. If there have been 2 or more separate transient disorders causing acute symptomatic seizures, the default standard applies (refer above).

Table 14 Medical criteria for marine pilots – Seizures and epilepsy	
Exceptional cases	Where a pilot with seizures or epilepsy does not meet the above criteria, Fit for Duty Subject to Review may be determined, based on consideration of the nature of the task and subject to annual review: • if, in the opinion of a medical specialist with specific expertise in epilepsy, and in consultation with the Authorised Health Professional, the risk to pilotage caused by a seizure is acceptably low; and • the pilot follows medical advice, including adherence to medication if prescribed.
Other factors that may influence fitness for duty status	
Epilepsy treated by surgery (where the primary goal of surgery is the elimination of epilepsy)	Fit for Duty Subject to Review may be determined, subject to annual review, taking into account information provided by a specialist in epilepsy as to whether the following criteria are met: • there have been no seizures for at least 10 years; and • an EEG conducted in the last six months has shown no epileptiform activity and no other EEG conducted in the last 12 months has shown epileptiform activity; and • the pilot follows medical advice with respect to medication adherence. The vision standard may also apply if there is a visual field defect.
Recommended reduction in dosage of anti-epileptic medication in a person who satisfies the standard for Fit for Duty subject to Review	Withdrawal of any anti-epileptic medication is incompatible with performing pilotage. Pilotage may continue: • if the dose reduction is due only to the presence of dose-related side effects and is unlikely to result in a seizure.

21.3 Balance and vestibular disorders

21.3.1 Relevance to marine pilots

Pilots need to embark and disembark ships using the pilot's ladder as detailed in Part C – Inherent Requirements. The ladder is up to 9 metres long and requires a vertical ascent or descent often in adverse weather conditions.

Pilots require a good sense of balance for climbing the ladder as well as walking and working on rolling ships. Disorders of balance or dizziness (vertigo) may affect the ability to undertake pilotage work.

Balance may be affected by disorders of the peripheral sense organs including the vestibular apparatus, proprioception or vision, as well as central disorders including those of the cerebellum and extra-pyramidal system. Loss of balance or dizziness may also arise from cardiac, endocrine and psychological causes. Vestibular disorders are of particular relevance and are discussed here. The relevant chapters should be referred to for other conditions.

A fear of heights is not consistent with working on the pilot's ladder. However pilots are recruited from experienced mariners who have experience of such ladders and have self-selected to the job. Therefore assessing for fear of heights is usually not a medical issue.

21.3.2 General assessment and management guidelines

Generally, those who suffer from unheralded attacks of dizziness (vertigo) are not fit for pilotage.

Balance should be clinically assessed by using a simple Romberg test. A pass requires the ability to maintain balance while standing with shoes off, feet together side-by-side, eyes closed and arms by sides, for thirty seconds. If needed the opinion of an appropriate specialist may be sought and additional assessments of balance may be conducted by an occupational therapist or physiotherapist.

The relevant chapters should be referred to for a lack of balance or dizziness (vertigo) found to be due to disorders of the central nervous system (refer to Section 21.4 Other neurological conditions) or visual causes (refer to Section 26 Vision and eye disorders). Episodes of dizziness or disturbances of balance without a clear diagnosis should be managed as for undifferentiated illness and the person classed Temporarily Unfit for Duty (refer to Section 15.2 Undifferentiated illness and fatigue).

Post-traumatic vertigo can arise from falls, car crashes, etc. and have multiple causes due to injury to the middle and inner ear. Surgical and medical treatments may be helpful. Individual assessment of balancing skills is needed regarding time of return to work.

Vestibular disorders are of particular relevance and are discussed below.

Vestibular disorders

Vestibular disorders may vary between symptomatic and quiescent with little warning. Vestibular malfunction can occur suddenly and with sufficient severity to make safe marine piloting impossible. It is often accompanied by nystagmus, which compounds the disability.

A pilot who suffers attacks of vertigo is not fit for operational duties.

Meniere's disease

Meniere's disease often results in recurrent vertigo despite treatment. The timing and frequency of the attacks vary. Some individuals can regularly predict when they will have an attack. Others note a completely random pattern. Attacks are often heralded by a sense of fullness in the affected ear. One in 25 sufferers also experience drop attacks (Tumarkin's Otolithic Crisis) – sudden falls without loss of consciousness. The natural history is one of progression in the affected ear associated with increasing hearing loss. In extreme cases total loss of vestibular function and partial loss of cochlear function can occur in the affected ear. Meniere's disease may not be compatible in the long run with operational duties. Due to considerable variation in symptoms cases need individual consideration regarding predictability of attacks.

Benign paroxysmal positional vertigo (BPPV)

Symptoms are typically triggered by changing head position, commonly by stooping or extending the neck to look up ('top-shelf vertigo'). Given the requirement to look up when climbing a pilot's ladder, vertigo may be precipitated. Pilots with BPPV must be symptom-free for a minimum of six months before a return to piloting duties can be considered. However severity varies considerably and variations to this exclusion period may be made on advice of an ENT specialist.

Vestibular neuritis and labyrinthitis (vestibular neuronitis, neurolabyrinthitis)

Vestibular neuritis and labyrinthitis are thought to result mostly from viral infections. Generally they are self-limiting conditions, however, symptoms such as vertigo may become persistent in some individuals. Where symptoms persist, fitness to resume piloting duties should be assessed on a case by case basis, although a significant symptom free period will be required prior to resuming duties. Persistence of symptoms beyond two to three months should prompt review of diagnosis.

Central causes

In persons with vertigo of recent onset, the clinical history should be considered carefully and the possibility of a cerebrovascular cause be considered. Note that cerebellar infarction is the main differential diagnosis for vestibular neuritis. For central causes of vertigo (such as stroke or TIA) refer to Section 21.4 Other Neurological conditions.

21.3.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 15.

A practical assessment on a pilot's ladder on land may be helpful in determining fitness for duty. (Refer to Section 14.8 Additional tests and marine specific resources)

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 15 Medical criteria for marine pilots – Vestibular disorders

Table 15 Medical criteria for marine pilots – Vestibular disorders	
CONDITION	**MEDICAL CRITERIA**
Vestibular disorders - Meniere's disease	A pilot is not Fit for Duty Unconditional: • if the pilot has Meniere's or suspected Meniere's disease. Fit for Duty Subject to Review, with at least annual review, may be determined taking into account the nature of the work and reports on work performance, and information provided by the treating ENT specialist, including response to treatment and whether the following criteria are met: • there is sufficient predictability of attacks so as to avoid occurrence when performing pilotage, and • the hearing standard is met.
Vestibular disorders - Benign paroxysmal positional vertigo (BPPV)	A pilot is not Fit for Duty Unconditional: • if the pilot has BPPV in any direction. Fit for Duty Subject to Review, may be determined taking into account the nature of the work and reports on work performance, and information provided by the treating general practitioner and/or ENT specialist, including response to treatment, pattern of disease and whether the following criterion is met: • the pilot has been free of vertigo for at least six months. A shorter period may be considered taking into account information provided by an ENT specialist.

21.4 Other neurological conditions

21.4.1 Relevance to pilotage

Neurological disorders may affect the ability to perform pilotage due to their effect on cognitive and interpersonal skills, vision, sensation, motor function or balance.

Although evidence of accident or incident risk is limited, it is very likely that symptoms that are common to many neurological conditions, such as potential spontaneous loss of consciousness, confusional states and impairment of muscular power and coordination, are deleterious to pilotage work.

21.4.2 General assessment and management guidelines

A pilot with a neurological disorder should be examined to determine the impact on the functions required for safe working as listed below. If the health professional is concerned about a pilot's ability to work safely, they may refer the pilot for a practical assessment of cognitive or musculoskeletal capacities (refer to Section 14.8 Additional tests and marine specific resources). Work performance reports may also be a useful source of information regarding overall safe working skills. For progressive conditions, deterioration in work performance may be the basis for a Triggered Health Assessment.

Checklist for neurological disorders

If the answer is YES to any of the following questions, the person may be unfit for pilotage work and will warrant further assessment.

1. Are there significant impairments of any of the following?
   - visuospatial perception
   - insight
   - judgement and the ability to respond appropriately in emergency situations
   - cognitive skills including attention and concentration
   - communication skills
   - reaction time
   - memory
   - sensation
   - muscle power
   - coordination
   - balance.
2. Are the visual fields abnormal? (Refer to Section 26 Vision and eye disorders)
3. Have there been one or more seizures? (Refer to Section 21.2 Seizures and epilepsy)
4. Is there loss of hearing or vertigo? If so refer to this section and Section 19 Hearing and Section 21.3 Balance and vestibular disorders

Some neurological conditions are progressive, while others are static. In the case of static conditions in those who meet the criteria for Fit for Duty Subject to Review, more frequent reviews than are required for the usual Periodic Health Assessment may not be needed.

Aneurysms (unruptured intracranial aneurysms and other vascular malformations)

Sudden severe haemorrhage from an intracranial aneurysm or vascular malformation may cause acute incapacity and affect safe working. However, the risk of sudden severe haemorrhage from some unruptured intracranial aneurysms and vascular malformations may be low enough to allow working. Pilots should be individually assessed for suitability for pilotage.

If the vascular malformation has bled and produced a neurological deficit, the pilot should be assessed to determine if any of the functions listed above are impaired of sufficient severity to affect pilotage.

If treated surgically, the advice regarding intracranial surgery applies (see 'Intracranial surgery', below). If the pilot has had a seizure, the seizures and epilepsy standards also apply (refer to Section 21.2 Seizures and epilepsy).

Cerebral palsy

Cerebral palsy may impair a pilot's ability to perform pilotage because of difficulty with motor control, or if it is associated with intellectual impairment or other disabilities. However, applicants with very mild cases may pass the necessary aptitude and musculoskeletal tests (refer to Section 20 Musculoskeletal conditions). As the disorder is usually static, more frequent review is not normally required.

Head injury

There are various severities of head injury. Any person who has had a traumatic injury causing loss of consciousness should not perform pilotage for a minimum of 24 hours, and the effects on functions listed in the checklist on page 140 should be monitored. Minor head injuries involving a loss of consciousness of less than one minute with no complications do not usually result in any long-term impairment. Similarly, immediate seizures that occur within 24 hours of a head injury are not considered to be epilepsy, but part of the acute process (refer to 'symptomatic seizures' in Table 14). Long-term risk of seizures will also need to be considered in light of the nature and severity of the head injury.

More significant head injuries may impair any of the neurological functions listed in the checklist on page 140 and can impair long-term fitness for pilotage. There may be a focal neurological injury affecting motor or sensory tracts as well as the cranial nerves. Also, personality or behavioural changes may affect judgement and tolerance, and be associated with a psychiatric disorder such as depression or post-traumatic stress disorder (PTSD). Clinical, neuropsychological or functional/practical assessments may be helpful in determining fitness for duty (refer to Section 14.8 Additional tests and marine specific resources).

Neurological recovery from a traumatic brain injury may occur over a long period and some people who are initially unfit may recover sufficiently after many months such that pilotage can be resumed. Pilots with appreciable impairments should initially be classed as Temporarily Unfit for Duty and then managed according to their progress.

Risk of posttraumatic epilepsy (PTE)

Persons with depressed skull fractures, traumatic intracranial haematoma or severe traumatic brain injury are at increased risk of epilepsy, especially in the first year. Pilots should be classed Temporally Unfit for Duty for 12 months after such an injury. If one or more seizures have

occurred, the symptomatic seizures standard applies. PTE should be distinguished from immediate post traumatic (acute symptomatic) seizures occurring within 24 hours of a head injury, which are considered part of the acute process (refer to 'acute symptomatic seizures' in Table 14).

Comorbidities such as drug or alcohol misuse, and musculoskeletal injuries may also need to be considered (refer to Sections 25 Substance misuse and dependence and Section 20 Musculoskeletal conditions).

Intracranial surgery (non-working periods may be varied by the neurosurgeon)

Non-working periods are advised to allow for the risk of seizures occurring after certain types of intracranial surgery. Following supratentorial surgery or surgery requiring retraction of the cerebral hemispheres, the pilot generally should not perform pilotage for 12 months and should be classed as Temporarily Unfit for Duty. There is no specific restriction after infratentorial or trans-sphenoidal surgery.

If one or more seizures occur, the standards for seizures and epilepsy apply (refer to Section 21.2 Seizures and epilepsy). Similarly, if there is long-term impairment of any of the functions listed in the checklist on page 140, fitness for work will need to be assessed.

Multiple sclerosis

Multiple sclerosis may produce a wide range of neurological deficits that may be temporary or permanent, and impair the performance of pilots. Possible deficits that may impair safe working include all of those listed on page 140. Where practical, job modifications such as use of helicopters may be made to assist with some of these impairments.

Neuromuscular disorders

Neuromuscular disorders include diseases of the peripheral nerves, muscles or neuromuscular junction, and may impair the performance of pilots. Peripheral neuropathy may impair safe working due to difficulties with sensation (particularly proprioception) or from severe weakness. Disorders of the muscles or neuromuscular junction may also interfere with the ability to climb a ladder (refer to Section 20 Musculoskeletal conditions). A functional or practical assessment may be required (refer to Section 14.8 Additional tests and marine specific resources).

Parkinson's disease

Parkinson's disease is a common, progressive disease that may affect safe working in the advanced stages due to motor manifestations (bradykinesia and rigidity) or cognitive impairments (deficits in executive function and memory, and visuospatial difficulties) and hence may impair the performance of pilots. When assessing the response to treatment, the response over the whole dose cycle should be taken into account (e.g. in patients with motor fluctuations, it would not be appropriate to assess fitness only on the basis of the best 'on' response). Most patients with severe motor fluctuations will be unfit for duty. A functional or practical assessment may be required (refer to Section 14.8 Additional tests and marine specific resources).

There may also be disturbances of sleep with episodes of sleepiness when working (refer to Section 24 Sleep disorders).

Stroke (cerebral infarction or intracerebral haemorrhage)

Stroke may impair safe working ability due to long-term neurological or an unrecognised visual field deficit, or due to the risk of a recurrent stroke or transient ischaemic attack (TIA) (refer below). However, stroke and TIA rarely cause loss of consciousness.

The risk of recurrent stroke is probably highest in the first month after the initial stroke, but is still sufficiently low (about 10% in the first year) that it does not on its own require suspension from pilotage. However, fatigue and impairments in concentration and attention are common after stroke, even in those with no persisting neurological deficits, and may impair the ability to perform pilotage. For this reason, there should be a non-working period after stroke for pilots, even in those with no detectable persisting neurological deficit.

For those with a persistent neurological deficit, subsequent fitness for duty will depend on the extent of impairment of the functions listed in the checklist on page 140. A functional or practical assessment may be required (refer to Section 14.8 Additional tests and marine specific resources). The vision standard may also apply (refer to Section 26 Vision and eye disorders). If the person has had a seizure, the seizures and epilepsy standards also apply (refer to Section 21.2 Seizures and epilepsy).

Transient ischaemic attack (TIA)

TIAs can be single or recurrent, and may be followed by stroke. They may impair safe working if they occur while at work. The risk of a further TIA or stroke is about 15% in the first 3 months and about half of that risk occurs in the first week. In view of the low risk of TIA or stroke affecting safe working, pilots should not work for 4 weeks after a TIA (Temporarily Unfit for Duty) and should be reassessed at that point. The pilot may then be classed as Fit for Duty Subject to Review by an appropriate specialist if there is no long-term impairment and risk of recurrence is low.

Subarachnoid haemorrhage

Pilots should not work for at least 6 months following a subarachnoid haemorrhage. Fit for Duty Subject to Review may be determined after this non-working period, taking into account the presence of neurological disabilities as described on page 140. The vision standard may also apply (refer to Section 26 Vision and eye disorders). If the person has had one or more seizures, the seizures and epilepsy standards also apply (refer to Section 21.2 Seizures and epilepsy). If a craniotomy has been performed, the advice for intracranial surgery also applies (refer to page 146). A functional or practical assessment may be considered (refer to Section 14.8 Additional tests and marine specific resources).

Space-occupying lesions, including brain tumours

Brain tumours and other space-occupying lesions (e.g. abscesses, chronic subdural haematomas and cysticercosis) may cause diverse effects depending on their location and type. They may impair any of the neurological functions listed on page 140. If the person has had one or more seizures, the seizures and epilepsy standards also apply (refer to Section 21.2 Seizures and epilepsy). If a craniotomy has been performed, the advice regarding intracranial surgery also applies (refer above).

21.4.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 16 (in alphabetical order), including standards for:

- aneurysms (unruptured intracranial aneurysms and other vascular malformations)
- cerebral palsy
- head injury
- intracranial surgery
- multiple sclerosis
- neuromuscular conditions
- Parkinson's disease
- stroke
- transient ischaemic attacks
- space-occupying lesions, including brain tumours
- subarachnoid haemorrhage.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 16 Medical criteria for marine pilots – Other neurological disorders

Table 16 Medical criteria for marine pilots – Other neurological disorders	
Condition	**Criteria**

Aneurysms (unruptured intracranial aneurysms) and other vascular malformations of the brain
(refer also to Subarachnoid haemorrhage, page 148)
	A pilot is not Fit for Duty Unconditional:
	• if the pilot has an unruptured intracranial aneurysm or other vascular malformation.
	
	Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist:
	• regarding the risk of symptomatic haemorrhage and the response to treatment; and
	• whether the following criteria are met:
	  ○ the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and
	  ○ the pilot has the capacity for safe dis/embarkation using the pilots ladder (also refer to Section 20 Musculoskeletal conditions).
	
	If treated surgically, the intracranial surgery advice applies (page 146).
	If the person has had a seizure, the seizure and epilepsy standards apply (refer to Section 21.2, Seizures and epilepsy).

Head injury and post traumatic epilepsy (refer also to intracranial page 146) **Post traumatic epilepsy**	A pilot is not Fit for Duty Unconditional: • if the pilot has a traumatic brain injury producing significant impairment of any of the following: visuospatial perception, insight, judgement, attention, reaction time, sensation, muscle power, balance, coordination or vision (including visual fields). Fit for Duty Subject to Review may be determined, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions). More frequent review is not required if the condition is static. A pilot is not Fit for Duty Unconditional: • if the pilot has a high risk of post traumatic epilepsy (penetrating brain injury, brain contusion, subdural haematoma, loss of consciousness/alteration of consciousness or post traumatic

Table 16 Medical criteria for marine pilots – Other neurological disorders	
Condition	**Criteria**
	amnesia greater than 24 hours). Fit for Duty Subject to Review may be considered: • if the pilot has had no seizures for at least 12 months. If a seizure has occurred, refer Table 14.
Intracranial surgery	**A pilot should be categorised Temporarily Unfit for Duty for 12 months following supratentorial surgery or surgery that involves retraction of the cerebral hemispheres.** If there are seizures or long-term neurological deficits, refer to Section 21.2 Seizures and epilepsy or Section 21.4 Other neurological conditions
Multiple sclerosis	A pilot is not Fit for Duty Unconditional: • if the pilot has multiple sclerosis. Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • the pilot has the capacity for safe dis/embarkation using the pilots ladder (also refer to Section 20 Musculoskeletal conditions).
Neuromuscular conditions (peripheral neuropathy, muscular dystrophy, etc.)	A pilot is not Fit for Duty Unconditional: • if the pilot has peripheral neuropathy, muscular dystrophy or any other neuromuscular disorder that significantly impairs muscle power, sensation or coordination. Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist: • regarding the level of impairment of muscle power, sensation balance or coordination; and • whether the pilot has the capacity for safe dis/embarkation using the pilots ladder. The pilot must meet the musculoskeletal requirements (refer to Section 20 Musculoskeletal conditions).

Table 16 Medical criteria for marine pilots – Other neurological disorders	
Condition	**Criteria**
Other neurological conditions	A pilot is not Fit for Duty Unconditional: • if the pilot has a neurological disorder that significantly impairs any of the following: visuospatial perception, insight, judgement, attention, reaction time, sensation, memory, muscle power, coordination, balance or vision (including visual fields). Fit for Duty Subject to Review may be determined subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions). More frequent review may not be necessary if the condition is static.
Parkinson's disease	A pilot is not Fit for Duty Unconditional: • if the pilot has Parkinson's disease. Fit for Duty Subject to Review may be determined subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions).
Space-occupying lesions (including brain tumours) (refer also to Intracranial surgery, page 146)	A pilot is not Fit for Duty Unconditional: • if the pilot has a space-occupying lesion. Fit for Duty Subject to Review may be determined subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions).

Table 16 Medical criteria for marine pilots – Other neurological disorders	
Condition	**Criteria**
	If seizures occur, the standards for seizures and epilepsy apply (refer to Section 21.2 Seizures and epilepsy). If surgically treated, the criteria for 'intracranial surgery' apply (refer to page 146).
Stroke **(cerebral infarction or intracerebral haemorrhage)**	**A pilot should be categorised Temporarily Unfit for Duty for at least 3 months following a stroke.** A pilot is not Fit for Duty Unconditional: • if the pilot has had a stroke. Fit for Duty Subject to Review may be determined after at least 3 months, subject to at least annual review, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions).
Subarachnoid haemorrhage (refer also to 'aneurysms', page 85)	**A pilot should be categorised Temporarily Unfit for Duty for at least 6 months after a subarachnoid haemorrhage.** A pilot is not Fit for Duty Unconditional: • if the pilot has had a subarachnoid haemorrhage. Fit for Duty Subject to Review may be determined after at least 6 months, taking into account the nature of the work and reports on work performance, and information provided by an appropriate specialist as to whether the following criteria are met: • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions).
Transient ischaemic attack (TIA)	**A person should be categorised Temporarily Unfit for Duty for at least 4 weeks following a TIA.** A pilot is not Fit for Duty Unconditional: • if the pilot has had a TIA. Fit for Duty Subject to Review may be determined after at least 4 weeks, taking into consideration the nature of the work and reports on work performance, and information provided by an appropriate specialist as to

Table 16 Medical criteria for marine pilots – Other neurological disorders	
Condition	**Criteria**
	whether the following criteria are met: • the risk of recurrence is low; and • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • the pilot has the capacity for safe dis/embarkation using the pilots ladder (refer to Section 20 Musculoskeletal conditions).

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

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22 Psychiatric conditions

(Refer also to sections 21 Neurological conditions and 25 Substance misuse and dependence)

Psychiatric disorders encompass a range of cognitive, emotional and behavioural disorders such as schizophrenia, depression, anxiety disorders and personality disorders. They also include dementia and substance abuse disorders, which are addressed elsewhere in the Standard (refer to sections 21.1 Dementia and 25 Substance misuse and dependence).

22.1 Interfacing programs

The Port Authority manages a comprehensive approach to ensuring pilots are fit to undertake the psychologically demanding task of pilotage. The Initial Licensing Health Assessment and Periodic Health Assessments represent one aspect of this. Figure 28 summarises these complementary approaches.

Marine pilots also undergo initial training and assessment, periodic training and performance assessment as specified in the NSW Marine Pilotage Code to demonstrate a range of communication and cognitive skills.

In addition, where pilots are concerned about issues that may impact on their mental health (e.g. financial, marital, work stress, substance misuse, health, etc.) they are encouraged to utilise confidential counselling through Employee Assistance Programs.

Pilots or the Port Authority may request a Triggered Health Assessment by an Authorised Health Professional. The assessment will depend on the clinical presentation and may be orientated towards psychiatric disorders, substance misuse or neurological disorders and possibly other medical conditions.

Policies relating to alcohol and substance use are a further interface, where referral for a Triggered Health Assessment may result from a positive drug/alcohol screen.

Figure 28 Management of pilots' mental health

	Port Authority (Pilots Code / SMS etc)	Health Assessment Standard / AHP
Initial Licensing /Recruitment	Initial training and assessment	Initial Licensing Health Assessment
Reaccreditation	Ongoing training and assessment	Periodic Health Assessment
For cause	Employee Assistance Program Drug and alcohol program	Triggered Health Assessment and referral / more frequent reviews as required
	Psychological capacity • Good cognitive skills re: navigation and situational awareness • Good communication skills re: bridge resource management • Ability to respond effectively in emergency situations	

22.2 Relevance to marine pilots

Pilotage is a complicated psychological task requiring good mental health which includes diverse mental capacities of a high order. These include:

- cognitive capacity for situational awareness, navigation, pilotage and decision making tasks;
- communication skills for effective teamwork, cultural awareness, interpersonal relationships, clear and easily understandable commands; and
- ability to respond effectively in emergency situations.

Psychiatric disorders may be associated with disturbances of behaviour, cognitive abilities and perception, and therefore have the potential to affect performance of pilotage work. They do, however, differ considerably in their aetiology, symptoms and severity, and may be occasional or persistent.

The range of potential impairments for various conditions is described below. These impairments are difficult to determine precisely because impairment differs at various phases of the illness and may vary markedly between individuals. Assessment of fitness for duty must be individualised, and should rely on evaluation of the specific pattern of illness and potential impact on mental capacities necessary for pilotage, rather than the diagnosis per se.

Table 17 Potential impairments associated with various psychiatric conditions

Table 17 Potential impairments associated with psychiatric conditions	
Condition	**Potential impairment/effects on abilities relevant to pilotage work**
Schizophrenia	Reduced ability to sustain concentration or attention Reduced cognitive and perceptual processing speeds, including reaction time Reduced ability to perform in complex situations such as when there are multiple distractions Abnormalities of perceptions such as hallucinations, which are distracting and pre-occupying Delusional beliefs that interfere with working, for example, persecutory beliefs may include being followed and result in erratic working Current antipsychotic medications do not have marked beneficial effects on cognition
Bipolar affective disorder	Depression and suicidal ideation Mania or hypomania, with impaired judgement about working safely, skill and associated recklessness Delusional beliefs that may directly affect work Grandiose beliefs that may result in extreme risk taking
Depression	Disturbance of attention, information processing and judgement, including reduced ability to anticipate situations Psychomotor retardation and reduced reaction times Sleep disturbance and fatigue Suicidal ideation that may result in reckless conduct

Table 17 Potential impairments associated with psychiatric conditions	
Condition	**Potential impairment/effects on abilities relevant to pilotage work**
Anxiety disorders	Preoccupation or distraction Decreased working memory Panic attacks Obsessional behaviours, including obsessional slowness, that impairs the ability to work efficiently and safely
Post traumatic stress disorder (PTSD)	Avoidance of certain situations related to traumatic experience Increased startle response Poor sleep and nightmares Recurrent intrusive memories (There may be overlap with depression and substance misuse)
Personality disorders	Aggressive or impulsive behaviour Resentment of authority or reckless behaviour Disordered interpersonal relationships Impaired decision making
Adult attention deficit hyperactivity disorder	Difficulty with sustaining attention, decision making, planning, organisation and prioritisation

22.3 General assessment and management guidelines

22.3.1 Identifying mental health problems

At the Initial Licensing and Periodic Health Assessments, pilots are required to self-declare any mental health conditions or substance misuse, and complete relevant questionnaires in relation to anxiety/depression (K10) and substance use (AUDIT).

Substantial anxiety/depression affects up to 10% of the adult population. The K10 Questionnaire (Table 19) is a well-validated tool for screening for anxiety and depression. It is a screening instrument, not a diagnostic tool; thus, examining health professionals should apply clinical judgement in the interpretation of the score and the action required. A detailed explanation of the tool and scoring is provided on page 162. If the person appears unduly familiar with the K10, other validated questionnaires may be applied.

Where a pilot is referred by the Port Authority for a Triggered Health Assessment, the nature of the assessment will depend on the clinical presentation and be orientated towards psychiatric disorders, substance misuse or neurological disorders and possibly other medical conditions. Further assessments may include MMPI or equivalent, neuropsychological assessment, drug and alcohol screening including hair analysis, or stress tests of performance in simulators. Referral to specialists will be appropriate to the working diagnosis.

An Authorised Health Professional may access a pilot's training record and senior pilot's assessment report to assess pilot's cognitive and interpersonal skills.

In the event of a pilot failing to attend a health assessment as requested, or not being cooperative, they should be assessed as Temporarily Unfit and the Port Authority notified. (Refer Section 7 Standard reporting framework - Fitness for duty classifications)

Where a new condition is identified an approach to management of the condition should be agreed such as referral to the pilot's general practitioner or to a psychiatrist or to an Employee Assistance Program. In some cases the pilot will need to be immediately classed Temporarily Unfit for Duty pending further assessment.

22.3.2 General management considerations

When assessing the impact of a mental illness on the ability to work safely, the focus should be on assessing the severity and significance of likely functional effects (refer Table 18), rather than the simple diagnosis of a mental illness. The review period should be tailored to the likely prognosis or pattern of progression of the disorder in an individual with a conservative approach to pilotage. Work performance reports may be a useful source of information regarding overall safe working skills and interpersonal skills. Reports of critical incidents, such as going aground, should also be considered.

Mild mental illness does not usually have a significant impact on functioning. Moderate levels of mental illness commonly affect functioning, but many people will be able to manage usual activities, often with some modification. Severe mental illness often impairs multiple domains of functioning, and it is this category that is most likely to impact on the functions and abilities required for pilotage. A pilot's medication requirements should not be used as the only measure of disease severity.

A pilot with insight may recognise when they are unwell and self-limit their working. Limited insight may be associated with reduced awareness or deficits, and may result in markedly impaired judgement or self-appraisal. Pilots with lack of insight should be classed as Temporarily or even Permanently Unfit for Duty as required.

Mental illness, particularly if accompanied by paranoid beliefs or lack of insight, may lead to noncompliance with requests to attend medical reviews or take prescribed medication, and may lead to difficulty obtaining a full picture of the pilot's condition and functioning. In cases where the Authorised Health Professional is not satisfied that they have a complete picture of the pilot's condition, the pilot should be classed Temporarily Unfit for Duty until adequate information can be obtained.

Neuropsychological testing may be helpful to forming an overall opinion of fitness for duty. The ability to cope under stress may be assessed via simulation or other means. (Refer to Section 14.8 Additional tests and marine specific resources).

22.3.3 Mental state examination

The mental state examination can be usefully applied in identifying areas of impairment that may affect fitness for duty.

- **Appearance**. Appearance is suggestive of general functioning (e.g. attention to personal hygiene, grooming, sedation, indications of substance use).

- **Attitude**. This may, for example, be described as cooperative, uncooperative, hostile, guarded or suspicious. Although subjective, it helps to evaluate the quality of information gained in the rest of the assessment and may reflect personality attributes.
- **Behaviour**. This may include observation of specific behaviours or general functioning, including ability to function in normal work and social environments.
- **Mood and affect**. This includes elevated mood (increase in risk taking) and low mood (suicidal ideation).
- **Thought form, stream and content**. This relates to the logic, quantity, flow and subject of thoughts, which may be affected by mania, depression, schizophrenia or dementia. Delusions with specific related content may impact on safe working ability.
- **Perception**. This relates to the presence of disturbances, such as hallucinations, that may interfere with attention or concentration, or may influence behaviour.
- **Cognition**. This relates to alertness, orientation, attention, memory, visuospatial functioning, language functions and executive functions. Evidence from formal testing, screening tests and observations related to adaptive functioning may be sought to determine if a psychiatric disorder is associated with deficits in these areas that are relevant to safe working.
- **Insight**. This relates to self-awareness of the effects of the condition on behaviour and thinking. Assessment requires exploration of the person's awareness of the nature and impacts of their condition, and has major implications for management.
- **Judgement.** The person's ability to make sound and responsible decisions has obvious implications for safety.

The examination may be supplemented by appropriate questionnaires.

22.3.4 Treatments of psychiatric conditions

Treatments, including 'talking therapies' and on-line therapy, may be useful as an alternative or supplement to medication, and lessen the risk of side-effects affecting working safely. (e-Mental health http://www.racgp.org.au/your-practice/guidelines/e-mental-health/).

Medications prescribed for treating psychiatric disorders may impair performance of marine pilots. However there is little evidence that medication contributes to incidents if taken as prescribed; in fact, it may even help reduce safety risks. The effects of prescribed medication should be considered, including:

- how medication may help to control or overcome aspects of the condition that may impact on working safely; and
- whether medication side effects may affect working safely, including risk of sedation, impaired reaction time, impaired motor skills, blurred vision, hypotension or dizziness.

Compliance with treatment should also be considered. Compliance may depend on a number of factors including the nature of the condition.

Pilots who are already being treated for psychiatric disorders should have a mental health plan which should be discussed at assessment. The plan should reference the need for cognitive and communication skills and responsiveness in emergency situations.

There may be a number of support programs available to pilots including Employee Assistance Programs and external services.

22.3.5 Acute psychotic episodes

A pilot suffering an acute severe episode of mental illness (e.g. psychosis, moderate–severe depression or mania) may pose a significant risk. They should be classed as Temporarily Unfit for Duty.

22.3.6 Substance misuse

(Also refer to Section 25 Substance misuse and dependence)

People with a 'dual diagnosis' of a psychiatric disorder and drug or alcohol misuse are likely to be at higher risk and warrant careful consideration. The assessment should seek to identify the potential relevance of:

- problematic alcohol consumption;
- use of illicit substances; and
- prescription drug abuse (e.g. increased use of sedatives or painkillers).

If a person is prescribed stimulants (e.g. dexamphetamine) for treating ADHD, this should be known to the Authorised Health Professional in case the person is subject to drug testing in the future.

22.4 Medical criteria

Medical criteria for fitness for duty are outlined in Table 18.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 18 Medical criteria for Pilots – Psychiatric disorders

Table 18 Medical criteria for Pilots – Psychiatric disorders	
Condition	**Criteria**
K10 score	If the pilot has a K10 score of ≥ 19, the pilot may be categorised as Temporarily Unfit for Duty or Fit for Duty Subject to Review while the causes are being assessed and managed (refer to Table 23): • For scores of 19–24, the pilot may be categorised Fit for Duty Subject to Review without external referral if the examining doctor feels the issues can be managed within the consultation. • For scores of 25–29, the pilot must be referred back to their treating doctor for further management. • If score is ≥ 30, the pilot must be categorised Temporarily Unfit for Duty pending further management.
Psychiatric disorders	A pilot is not Fit for Duty Unconditional: • if the pilot has a psychiatric disorder; or • if the Authorised Health Professional believes that there is a significant risk of a previous psychiatric condition relapsing. Fit for Duty Subject to Review may be determined, subject to annual review, taking into account the nature of the work, work performance reports and information provided by a psychiatrist as to whether the following criteria are met: • the pilot has the psychological capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working, and • the pilot has the psychological capacity for safe dis/embarkation using the pilots ladder, and • the condition is well controlled and the pilot is compliant with treatment during a substantial period, and • the pilot has insight into their condition and its potential effects on safe working; and • there are no adverse medication effects that may impair their capacity for safe working; and • the impact of comorbidities has been considered (e.g. substance abuse).

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

Table 19 K10 Questionnaire

Please tick the answer that is correct for you:	All of the time (Score 5)	Most of the time (Score 4)	Some of the time (Score 3)	A little of the time (Score 2)	None of the time (Score 1)
1. In the past 4 weeks, about how often did you feel tired out for no good reason?	☐	☐	☐	☐	☐
2. In the past 4 weeks, about how often did you feel nervous?	☐	☐	☐	☐	☐
3. In the past 4 weeks, about how often did you feel so nervous that nothing could calm you down?	☐	☐	☐	☐	☐
4. In the past 4 weeks, about how often did you feel hopeless?	☐	☐	☐	☐	☐
5. In the past 4 weeks, about how often did you feel restless or fidgety?	☐	☐	☐	☐	☐
6. In the past 4 weeks, about how often did you feel so restless you could not sit still?	☐	☐	☐	☐	☐
7. In the past 4 weeks, about how often did you feel depressed?	☐	☐	☐	☐	☐
8. In the past 4 weeks, about how often did you feel that everything was an effort?	☐	☐	☐	☐	☐
9. In the past 4 weeks, about how often did you feel so sad that nothing could cheer you up?	☐	☐	☐	☐	☐
10. In the past 4 weeks, about how often did you feel worthless?	☐	☐	☐	☐	☐

Box 1 Anxiety/depression: K10 Questionnaire

Interpreting K10 scores

The creators of the K10 have not developed or published details on scoring the scale, thus various interpretations of scoring have been used.

The 2001 Victorian Population Health Survey adopted a set of cut-off scores based on how practitioners use the K10 as a screening tool. These scores are outlined in Table 20 and provide a useful overview of how the K10 can be applied for screening purposes in general practice.

Table 20 K10 cut-off scores

K10 score	Likelihood of having a mental disorder
10–19	Likely to be well
20–24	Likely to have a mild disorder
25–29	Likely to have a moderate mental disorder
30–50	Likely to have a severe mental disorder

Source: 2001 Victorian Population Health Survey *to estimate the prevalence of levels of psychological distress*

National population results based on this scoring system (National Health Survey 2001) are shown in Table 21, indicating that 85.8% of males and 79.6 % of females have low levels of psychological distress or are likely to be well with respect to their mental health.

The table also shows that 8.3% of males and 10.6% of females are likely to have a mild mental disorder, 3.1% of males and 5.5% of females are likely to have a moderate disorder and 2.7% of males and 4.4% of females are likely to have a severe disorder.

Table 21 National Health Survey 2001—level of psychological distress

Level of psychological distress (K10 score)	Males (%)*	Females (%)*
Low (10–19)	85.8	79.6
Moderate (20–24)	8.3	10.6
High (25–29)	3.1	5.5
Very high (30–50)	2.7	4.4
Total	100.0	100.0

* Age standardised percentages

When defining the cut-off scores for pilotage work, key considerations are the specificity and sensitivity of the test—sensitivity being the measure of a test's ability to detect an illness and specificity being a measure of a test's ability to only diagnose those people who have the condition, not those who do not have it. The aim is to optimise the ability to detect people with the illness while limiting the number of false positives.

Table 22 (Andrews & Slade 2001) shows the sensitivity and specificity for the K10 at various scoring levels. A cut-off score of 19 results in a sensitivity of 71% and a specificity of 90% (i.e. 10% incorrect detection). A cut-off score of 20 results in lower sensitivity (66%) and slightly higher specificity. Given the importance of psychological health for pilotage work, the cut-off of 19 with 71% sensitivity has been identified for initiating intervention in these pilots, albeit with a 10% false positive rate.

Table 22 Sensitivity and specificity of the K10 in identifying people who met Composite International Diagnostic Interview criteria for any current anxiety or affective disorder (prevalence 7.1%)

K10 score greater than or equal to	Sensitivity (hit rate)	Specificity correct (rejection rate)
14	0.94	0.63
15	0.90	0.72
16	0.86	0.78
17	0.81	0.83
18	0.77	0.87
19	0.71	0.90
20	0.66	0.92
21	0.60	0.94
22	0.55	0.95
23	0.50	0.97
24	0.45	0.97
25	0.41	0.98
26	0.36	0.98
27	0.33	0.99
28	0.31	0.99
29	0.27	0.99
30	0.24	0.99
31	0.21	1.00
32	0.16	1.00

Box 1 Anxiety/depression: K10 Questionnaire

Use of the K10 for marine pilots

The purpose of applying the K10 to marine pilots is to screen for mental health disorders that may affect attentiveness and thus the ability to perform pilotage work.

The examining health professional is required to evaluate the responses to the questionnaire in conjunction with supporting information provided by the organisation, such as absenteeism and accident history, which may provide indications of a mental health problem. The examining health professional should also form a clinical impression of the patient and consider if this is consistent with the score on the K10.

The examining health professional may also feel it is appropriate to make contact with a pilot's general practitioner to discuss their history. Based on these inputs, the examining health professional will form a view as to whether they believe there is a significant current risk that the pilot might be impaired at work.

Administering the K10

In the pilots' health assessment, the *K10 Questionnaire* is administered in a self-report format; however, it can also be administered by interview if necessary.

The cognitive capacities (e.g. literacy, forgetfulness) and the level of cooperation or defensiveness of the pilot should be considered in selecting the appropriate format.

Dishonest completion may be an issue, so review of the responses with the pilot is desirable, as is consideration of the overall clinical picture. It may be helpful to reassure the pilot that all responses are confidential and are not forwarded to the operator.

Scoring the K10 and managing marine pilots

As previously indicated, a total score of 50 is possible.

Higher scores indicate a greater likelihood of mental disorder and a need for more intensive treatment.

Table 23 provides a guide for managing pilots according to their K10 score. Examining health professionals should also consider supporting information such as accident/incident history and sick leave, as well as the clinical examination when selecting the appropriate intervention.

As a general rule, patients who rate most commonly 'Some of the time' or 'All of the time' categories are in need of a more detailed assessment, and may not be fit to continue pilotage work.

Pilots who rate most commonly 'A little of the time' or 'None of the time', generally do not require further assessment; however, the clinical examination may indicate otherwise and will guide the final decision in this regard.

It is important to note that high scores may be the result of acute distress brought on by domestic or work stress, or may be due to endogenous causes. Interventions appropriate to the particular situation will therefore need to be identified.

Where work stress is identified as a factor in a raised score, the examining health professional is in a good position to constructively intervene and advise on remedial steps regarding work load, job re-organisation, training, conflict resolution and so on.

Risk Zone I – K10 scores between 10 and 19

Scores below 19 indicate that the pilot is likely to be well but should be considered in the context of the overall clinical impression of the patient.

Although no formal intervention is required, reference to the importance of mental health for pilotage work is appropriate. Information and resources may also be provided to highlight symptoms and sources of support.

Risk Zone II – K10 scores between 19 and 24

Scores in this zone indicate that the pilot is likely to have a mild disorder (specificity greater than 90%). The examining health professional should explore possible reasons including domestic or work stress, and provide brief counselling as required. The examining health professional should identify sources of support or guidance that may be helpful to the pilot, including work-based employee assistance programs, community support services or the pilot's general practitioner.

The examining health professional may assess the pilot as Fit for Duty Subject to Review to flag the issue for attention at subsequent assessments. The period of review may be earlier or in line with normal periodic frequencies, depending on the clinical assessment and other indicators.

Box 1 Anxiety/depression: K10 Questionnaire

Risk Zone III – K10 scores between 25 and 29

This zone indicates the pilot is likely to suffer from a moderate mental disorder (specificity greater than 98%).

Again, the examining health professional should explore possible reasons and consider the supporting information and clinical picture.

Pilots in this zone should be managed by a combination of brief counselling, referral to the pilot's general practitioner and continued monitoring.

The examining health professional may assess the pilot as Fit for Duty Subject to Review and should refer for external assessment via the pilot's general practitioner. Alternatively, the examining health professional may classify the pilot as Temporarily Unfit for Duty if there are immediate concerns for safe working.

Risk Zone IV – K10 scores equal to or greater than 30

Scores in this zone indicate that the pilot is likely to have a severe mental disorder (specificity greater than 99%).

They should be assessed as Temporarily Unfit for Duty pending further assessment, and referred to their general practitioner in the first instance.

Table 23 K10 risk levels and interventions

Risk levels	K10 score	Intervention	Assessment conclusion for pilotage work
Zone I	**10–18**	No formal intervention. Consider the consistency of the clinical impression with the score. General advice about the importance of mental health for pilotage work, and alert to further information and resources.	Fit for Duty
Zone II	**19–24**	Brief counselling and reference to self-help materials and support services as applicable to the situation.	May be assessed as Fit for Duty Subject to Review. Review period may be in line with normal periodic review periods, or more frequently if the situation warrants it.
Zone III	**25–29**	Brief counselling, referral to general practitioner and continued monitoring.	May be assessed as Fit for Duty Subject to Review or Temporarily Unfit for Duty, depending on the situation. The review period will depend on the individual situation.
Zone IV	**30–50**	Refer for diagnostic evaluation and treatment. Review as appropriate.	Should be assessed as Temporarily Unfit for Duty while being evaluated and while treatment is initiated. Return to work will depend on the effectiveness of treatment.

References and further reading

Andrew G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale. Australian and New Zealand Journal of Public Health 2001. 25(6): 494-497.

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Charlton JL, et al. Influence of chronic illness on crash involvement of motor vehicle drivers, 2nd edn, Monash University Accident Research Centre, Melbourne. 2010

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Wylie KR, Thompson DJ, Wildgust HJ, Effects of depot neuroleptics on driving performance in chronic schizophrenic patients. Journal of Neurology, Neurosurgery and Psychiatry. 1993;56(8): 910-913

23 Respiratory diseases

See also VO_2 max in Section 17.2.2 Cardiorespiratory fitness and diseases.

23.1 Relevance to marine pilots

Respiratory disease may affect the ability of pilots to perform their work safely. Good respiratory function is essential to meet the oxygen demands associated with climbing the pilot's ladder and stairs on ships, and not be exhausted on reaching the bridge.

Clear speech is required for communication particularly by radio-communication systems. Assessment of a speech impediment arising from conditions such as cleft palate or facial trauma (similar to that in association with a foreign accent) is not a medical matter. It should be assessed as part of general competencies by the Port Authority (refer to NSW Marine Pilotage Code competencies).

23.2 General assessment and management guidelines

Cardiorespiratory function is assessed using a test of VO_2 max. The test method and criteria to be applied are outlined in Section 17 Cardiovascular fitness and diseases.

23.2.1 Laryngectomy and tracheostomy

Persons with a tracheostomy or laryngectomy are unsuitable for pilotage. The work requires the ability to speak clearly and quickly including use of radio-communications as well as high respiratory demands.

23.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 24.

Chronic respiratory disease (e.g. asthma, COPD) of any severity is not compatible with marine pilotage. Pilots with asthma should have 'Good Control' as defined in the Australian Asthma Handbook (http://www.asthmahandbook.org.au/management/adults).

Patients with mild, well-controlled disorders should be assessed using the VO_2 max test and meet the criteria of 'above average' (refer to Figure 16).Those meeting the criteria may be categorised Fit for Duty Subject to Review, with annual review.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 24 Medical criteria for marine pilots – Respiratory diseases

Table 24 Medical criteria for marine pilots – Respiratory diseases	
CONDITION	**CRITERIA**
VO_2 max	Refer to Section 17.2.2 Cardiorespiratory fitness (VO_2 max).
Chronic respiratory disease (e.g. asthma, COPD)	A pilot is not Fit for Duty Unconditional: • if the pilot has chronic respiratory disease. Fit for Duty Subject to Review may be determined if the condition is well controlled and the VO_2 max reaches the criteria of above average.
Laryngectomy and tracheostomy	A pilot is not Fit for Duty: • post laryngectomy or tracheostomy.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

References

Palmer K. and Pearson S. Respiratory disorders. Chapter 18 in Fitness for Work; Eds: Palmer, K. Cox R and Brown I. Oxford University Press. 2007.

24 Sleep disorders (and fatigue)

24.1 Scope and interfaces

This chapter focuses on sleep disorders, particularly sleep apnoea, as they present a significant risk to safety through increased sleepiness. This chapter interfaces with fatigue risk management (refer to Section 3.8 Fatigue management).

24.2 Medical aspects of fatigue

The various non-specific symptoms of fatigue include feeling tired, drained or exhausted sometimes with an associated loss of alertness, poor judgement and irritability. Sleepiness is not necessarily a feature.

It is acknowledged that many chronic illnesses can cause fatigue, which may or may not be associated with increased sleepiness. A pilot may therefore be referred for a health assessment (Triggered Health Assessment) with symptoms of fatigue in association with poor work performance or incidents. They should be assessed for a broad range of medical conditions and related factors including the following:

- medical conditions including anaemia, diabetes, hypothyroidism, cardiac disease, sleep disorders;
- psychological conditions including depression, anxiety, PTSD, substance misuse;
- social factors including family and relationship problems;
- occupational factors including rosters, shiftwork and sleeping arrangements, bullying/conflict.

Fatigue is often associated with work-sleep imbalance. It may arise in conjunction with the demands of irregular work hours and (belt) rosters over the years. Pilots often have records of their rosters which may help in diagnosis and management (if job modification is required). There are no criteria for diagnosing or managing fatigue. Each case needs to be assessed and managed on its merits (refer to Section 15.2 Undifferentiated illness and fatigue). Pilots should be assessed and categorised appropriately with regard to fitness for duty as per this Standard, and referred to their general practitioner as required.

24.3 Relevance to marine pilots

24.3.1 Effects of sleep disorders on pilotage work

A number of sleep disorders may cause excessive daytime sleepiness, which manifests itself as a tendency to doze at inappropriate times when intending to stay awake, and which has obvious implications for safety. Relevant disorders include:

- sleep apnoea (obstructive sleep apnoea*, central sleep apnoea and nocturnal hypoventilation);
- periodic limb movement disorder;
- circadian rhythm sleep wake disorders (e.g. advanced or delayed sleep-phase syndrome);
- some forms of insomnia; and narcolepsy.

*For the purposes of this document sleep apnoea syndrome is excessive daytime sleepiness in combination with sleep apnoea on overnight monitoring.

Such disorders may affect the ability to safely perform pilotage due to sleepiness and/or due to altered blood gases and hypoxia affecting mental function. Sleep apnoea may also worsen conditions relevant to pilotage work such as hypertension and depression and is associated with type 2 diabetes.

24.3.2 Evidence of incident risk

Information about risk of accidents due to sleep disorders mainly comes from road crash data. Studies have shown an increased rate of motor vehicle accidents of between 2 and 7 times that of control subjects in those with sleep apnoea. Studies have also demonstrated increased objectively measured sleepiness while driving (electroencephalography and eye closure measurements) and impaired driving-simulator performance in sleep apnoea patients. This performance impairment is similar to that seen due to illegal alcohol impairment or sleep deprivation. Drivers with severe sleep disordered breathing may have a much higher rate of accidents than those with a less severe sleep disorder. Drivers with a high Epworth Sleepiness Scale (ESS) score have a higher crash risk (see below). Those with self-reported episodes of dozing, or frequent sleepiness while driving, are also at a higher crash risk, irrespective of sleep apnoea severity.

Patients with narcolepsy present with excessive sleepiness, and can have periods of sleep with little or no warning of sleep onset. Other symptoms include cataplexy, sleep paralysis and vivid hypnagogic hallucinations, which present a significant risk for pilotage. Those with narcolepsy perform worse than control subjects on simulated driving tasks and are more likely to have (motor vehicle) accidents.

24.4 General assessment and management guidelines

24.4.1 General considerations

Sleep apnoea is present on overnight monitoring in 9% of adult women and 24% of adult men. Sleep apnoea syndrome (see above) is present in 2% of women and 4% of men.

Obstructive sleep apnoea involves repetitive obstruction to the upper airway during sleep, precipitated by relaxation of the dilator muscles of the pharynx and tongue and/or narrowing of the upper airway, resulting in cessation (apnoea) or reduction (hypopnoea) of breathing.

Central sleep apnoea refers to a similar pattern of cyclic apnoea or hypopnoea caused by oscillating instability of respiratory neural drive, and not due to upper airways factors. This condition is less common than obstructive sleep apnoea, and is associated with cardiac or neurological conditions, or may be idiopathic. Hypoventilation associated with chronic obstructive pulmonary disease (COPD) or chronic neuromuscular conditions may also interfere with sleep quality, causing excessive sleepiness.

Increased sleepiness during the daytime may also occur in otherwise normal people and may be due to either:

- previous sleep deprivation (restricting the time for sleep); or
- poor sleep hygiene habits; or
- irregular sleep–wake schedules (e.g. rosters); or
- the influence of sedative medications including alcohol.

These factors may increase the severity of sleep disorders and result in more severe sleepiness in pilots with sleep disorders.

Unexplained episodes of 'sleepiness' may also require consideration of the several causes of blackouts (refer to Section 16 Blackouts).

The approach to the assessment for sleep disorders is summarised in Figure 29 and described below. It involves identifying:

- whether there is evidence or indicators of excessive daytime sleepiness;
- whether there is clinical evidence of sleep apnoea (loud snoring, witnessed apnoea events); and
- whether there are clinical risk factors that warrant further investigation.

24.4.2 Assessing for high risk of excessive daytime sleepiness

Epworth Sleepiness Scale (ESS)

Determining excessive daytime sleepiness may be assisted with screening tools. Subjective measures include tools such as the ESS (refer to Figure 30), which is incorporated into the health questionnaire. The ESS is scored by summing the numeric values in the boxes in the questionnaire; the maximum possible is 8 x 3 = 24. A score of between 0 and 10 is within the normal range.

Mild to moderate self-reported sleepiness (ESS score of 11 to 15) may be associated with a significant sleep disorder, although the degree of increased risk of sleepiness-related (motor vehicle) accidents is unknown. Scores of 16 to 24 are consistent with moderate to severe sleepiness, and are associated with an increased risk of sleepiness-related accidents.

If the score is raised (16 or more) or other clinical findings warrant it, discuss the findings with the pilot to determine possible explanations, such as the demands of shift work, lifestyle factors or sleep disorders, to help guide the approach to management. This may include referral to their general practitioner or to a sleep clinic for polysomnography (PSG). In most cases, the pilot will need to be immediately classed Temporarily Unfit for Duty pending further assessment.

It is recognised that tests such the ESS rely on honest completion by the pilot, and there is evidence that incorrect reporting may occur.[21] The use of such tools is therefore just one aspect of the comprehensive assessment.

Other indicators of excessive daytime sleepiness

History of self-reported sleepiness at work, witnessed episodes of dozing at work and work performance or incident reports are indicative of excessive sleepiness at work and should also prompt further investigation, including a sleep study (see below). Pilots should be classed Temporarily Unfit for Duty while being investigated.

[21] Colquhoun C and Casolin A. Impact of rail medical standard on obstructive sleep apnoea prevalence. Occupational Medicine. 2015

Figure 29 Sleep disorder assessment and management

*If BMI≥35 the pilot should also be managed regarding musculoskeletal capacity on the pilots ladder as per Section 20 Musculoskeletal conditions (including BMI).

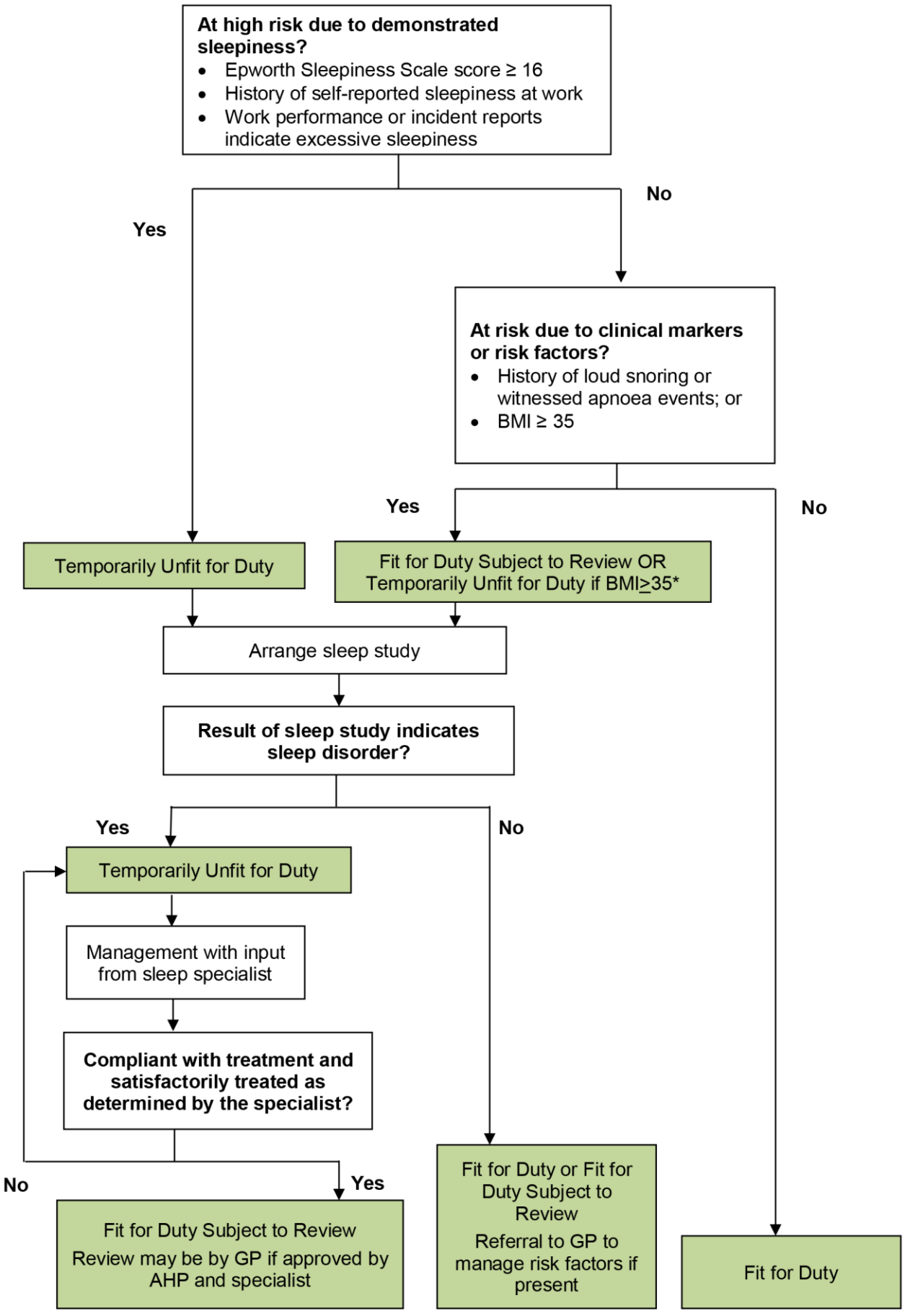
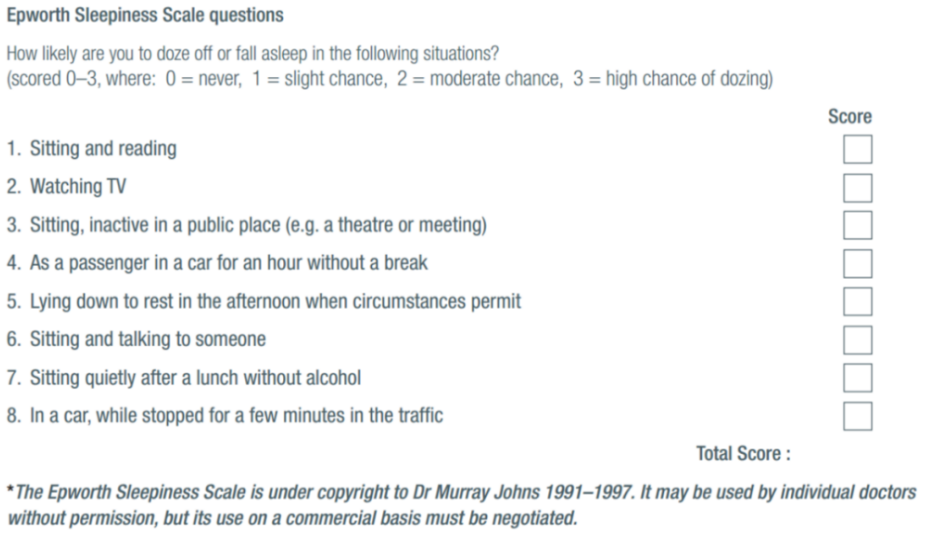


Figure 30 Epworth Sleepiness Scale questions



Epworth Sleepiness Scale questions

How likely are you to doze off or fall asleep in the following situations?
(scored 0–3, where: 0 = never, 1 = slight chance, 2 = moderate chance, 3 = high chance of dozing)

	Score
1. Sitting and reading	☐
2. Watching TV	☐
3. Sitting, inactive in a public place (e.g. a theatre or meeting)	☐
4. As a passenger in a car for an hour without a break	☐
5. Lying down to rest in the afternoon when circumstances permit	☐
6. Sitting and talking to someone	☐
7. Sitting quietly after a lunch without alcohol	☐
8. In a car, while stopped for a few minutes in the traffic	☐
Total Score :	

24.4.3 Clinical assessment including biometric markers of sleep apnoea

Common clinical indicators of sleep apnoea include:

- habitual loud snoring during sleep;
- witnessed apnoeic events (often in bed by a partner) or falling asleep inappropriately (particularly during non-stimulating activities such as watching TV, sitting and reading, travelling in a car or when talking with someone, as measured by the Epworth Sleepiness Scale (ESS)); and
- feeling sleepy despite adequate time in bed.

Poor memory and concentration, morning headaches and insomnia may also be presenting features. The condition is more common in men and with increasing age and in association with type 2 diabetes.

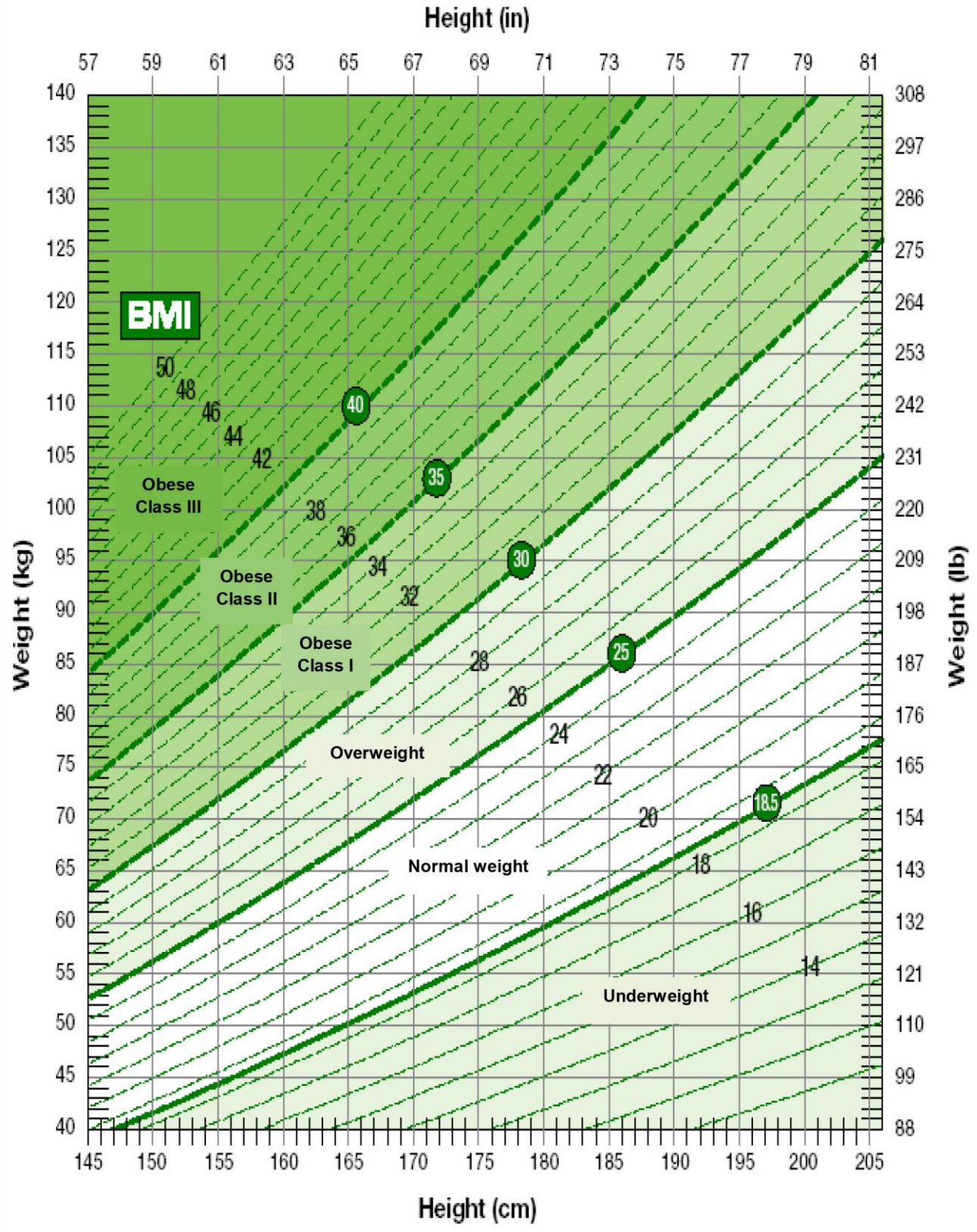
Body mass index is also a strong predictor of sleep disorder. The presence of a body mass index (BMI) greater than or equal to 35 should increase the suspicion of sleep apnoea, even in the absence of self-reported sleepiness.

24.4.4 Referral and management (refer Figure 29)

Pilots with clinical features of sleep apnoea or high-risk features as described above should have a sleep study, which may be arranged by the Authorised Health Professional. They should be classed as follows:

- Fit for Duty Subject to Review for symptoms alone until the disorder is investigated, treated effectively and fitness for duty status finally determined (refer to Figure 29); or
- Fit for Duty Subject to Review or Temporarily Unfit for Duty if the BMI is equal to or greater than 35, depending on the results of the musculoskeletal assessment (Section 20 Musculoskeletal conditions (including BMI)) and pending results of a sleep study, then categorised accordingly (refer to Figure 29).

Figure 31 Body Mass Index (BMI) nomogram



Initial screening may be conducted using polysomnography packages that are available for home assessment. The investigation (during a period of sleep) should include as a minimum:

- respiratory function testing (including oro-nasal airflow, rib cage/abdominal movement, heart rate and oximetry).

The investigation preferably should also include the following where logistics and practicality permits:

- a continuous recording of an electrocardiograph (ECG)
- a continuous recording of an electroencephalograph (EEG).

The results should be interpreted and reported on by a sleep physician who has established quality assurance procedures for the data acquisition. Pilots with a positive result should be examined by the sleep specialist (videolink is acceptable) to confirm and explain the diagnosis, to explain treatment options and to explain the monitoring of compliance.

Pilots who are diagnosed with obstructive sleep apnoea syndrome and commence treatment satisfactorily should be categorised Fit for Duty Subject to Review and have annual review to ensure that adequate treatment is maintained. Initial determination of Fit Subject to Review should be established by the treating specialist. The Authorised Health Professional, with agreement of the specialist, may determine that subsequent review by the pilot's treating general practitioner is sufficient if there is an established pattern of compliance and good response to treatment.

Those treated with CPAP should use a CPAP machine with a usage meter to allow objective assessment and recording of treatment compliance. Similarly, for those treated with mandibular splints, only splints with compliance detection devices should be used.

Pilots with severe sleep apnoea on diagnostic sleep study but who do not report moderate to excessive sleepiness, should never-the-less be offered treatment as symptoms are sometimes not recognised. Pilots who refuse treatment may be offered a Maintenance of Wakefulness Test (MWT) for further assessment; (the MWT should include a drug screen and be for 40 minutes). A repeat sleep study may be recommended depending on the clinical review. For those with a normal MWT, they may be categorised fit without sleep apnoea treatment, subject to review in one year. Those with an abnormal MWT should remain Temporarily Unfit for Duty until appropriate treatment is able to be initiated and is shown to be effective.

If the sleep study is normal, this should be clearly documented in the pilot's medical report so that this information is available for consideration at subsequent health assessments. If high-risk features remain present at subsequent assessments, the specialist should be asked to advise regarding the timing of their next sleep study. Pilots with risk factors such as high BMI should be managed accordingly, including with referral to their general practitioner and Port Authority health promotion program as appropriate.

24.4.5 Advice to pilots

Pilots suspected of having, or found to have, sleep apnoea or other sleep disorders should be advised about potential impact on pilotage and strategies for maintaining fitness for duty. General advice should include:

- minimising unnecessary activity at times when normally asleep;
- allowing adequate time for sleep;

- avoiding working after having missed a large portion of their normal sleep;
- avoiding alcohol and sedative medications;
- resting if sleepy;
- ensuring the sleep environment is cool, dark and quiet.

Pilots are responsible for:

- notifying management if they are sleepy and not fit for duty for that shift;
- complying with treatment, including management of lifestyle factors;
- maintaining their treatment device;
- attending review appointments;
- honestly reporting their condition to their treating physician and the Authorised Health Professional.

24.4.6 Narcolepsy

Narcolepsy is present in 0.05% of the population and usually starts in the second or third decade of life. Sufferers present with excessive sleepiness and can have periods of sleep with little or no warning of sleep onset. Other symptoms include cataplexy, sleep paralysis and vivid hypnagogic hallucinations.

The majority of sufferers are HLA-DR2 (a serotype) positive. There is a subgroup of people who are excessively sleepy, but do not have all the diagnostic features of narcolepsy.

Diagnosis of narcolepsy is made on the combination of clinical features (sleep attacks, cataplexy, hypnagogic hallucinations and sleep paralysis), HLA typing and multiple sleep latency test (MSLT), with a diagnostic sleep study on the previous night to exclude other sleep disorders and aid interpretation of the MSLT.

Pilots suspected of having narcolepsy should be referred to a respiratory or sleep physician or neurologist for assessment (including a MSLT) and management. If the diagnosis is confirmed they should be categorised Temporarily Unfit for Duty until there have been no symptoms for 6 months. They should have a review at least annually by their specialist.

Sleepiness in narcolepsy may be managed effectively with scheduled naps and stimulant medication. Tricyclic antidepressants and monoamine oxidase (MAO) inhibitors are used to treat cataplexy.

24.5 Medical criteria

Medical criteria for fitness for duty are outline in Table 25.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 25 Medical criteria for marine pilots – Sleep disorders

Table 25 Medical criteria for marine pilots – Sleep disorders	
Condition	**Criteria**
Sleep disorder risk assessment (refer Figure 29)	***Demonstrated sleepiness*** A pilot is not Fit for Duty Unconditional: • if there is evidence of excessive daytime sleepiness such as : - an ESS score of 16 or greater; or - a history of self-reported sleepiness at work; or - work performance reports indicating excessive sleepiness; or - incident reports plausibly caused by inattention or sleepiness They should be classed Temporarily Unfit for Duty and promptly assessed by a specialist in relation to a possible sleep disorder. If a sleep disorder is diagnosed, see relevant criteria below. If excessive daytime sleepiness is not evident, assess risk factors as below. ***Risk factors*** A pilot is not Fit for Duty Unconditional: • if the pilot is assessed as being at risk of sleep disorder, as evidenced by a history of habitual loud snoring during sleep or of witnessed apnoeic events (such as in bed by a partner). They should be classed Fit for Duty Subject to Review and promptly assessed by a specialist in relation to a possible sleep disorder. If a sleep disorder is diagnosed, see relevant criteria below. A pilot is not Fit for Duty Unconditional: • if the pilot is assessed as being at risk of sleep disorder, as evidenced by a BMI ≥ 35. They should be promptly assessed by a specialist in relation to a possible sleep disorder. Fitness for duty classification (Fit Subject to Review or Temporarily Unfit) while they are waiting to be assessed is dependent on the result of the musculoskeletal assessment. If a sleep disorder is diagnosed, see relevant criteria below.
Sleep apnoea	A pilot is not Fit for Duty Unconditional: • if the pilot has established sleep apnoea syndrome); or • if the pilot has severe sleep apnoea on a diagnostic sleep study with or without self-reported excessive daytime sleepiness.

Table 25 Medical criteria for marine pilots – Sleep disorders	
Condition	**Criteria**
	Fit for Duty Subject to Review may be determined, subject to annual review, taking into account the nature of the work and work performance reports, and information provided by a specialist* in sleep disorders as to whether the following criteria are met: • the pilot is compliant with treatment**; and • the response to treatment is satisfactory. *The Authorised Health Professional, with agreement by the specialist, may determine that review by the pilot's treating general practitioner is sufficient if there is an established pattern of compliance and good response to treatment. The initial granting of Fit for Duty Subject to Review must be based on information provided by a specialist. **If person refuses treatment, refer text.
Narcolepsy	A pilot is not Fit for Duty Unconditional: • if narcolepsy is confirmed. Fit for Duty Subject to Review may be determined, subject to annual review, taking into account the nature of the work and work performance reports, and information provided by a specialist in sleep disorders as to whether the following criteria are met: • a clinical assessment has been made by a sleep physician; and • cataplexy has not been a feature in the past; and • medication is taken regularly; and • there have been no symptoms for 6 months; and • normal sleep latency present on multiple sleep latency test (MSLT) (on or off medication).
Other causes of excessive daytime sleepiness	Refer to guidelines in the text.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

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25 Substance misuse and dependence

This chapter should be read in the context of overall management of mental health (refer to Section 22 Psychiatric Conditions).

25.1 Scope and definitions

This section focuses on diagnosis and management of pilots who have substance misuse or substance dependence. It is concerned with all substances that can impair cognition in regards to safety.

Substance misuse may be seen as a continuum ranging from mild / occasional use to severe / dependence.

For the purpose of this Standard, the term substance misuse refers to the use of any substance whether legal or illegal which causes the individual social, psychological, physical or legal problems related to intoxication, binge use or dependence. This includes:

- chronic heavy consumption of alcohol; and
- misuse of prescription and over the counter medication; and
- use of illicit drugs; and
- use of natural unregulated intoxicants e.g. Datura, mushrooms etc.

Substance dependence is a condition that falls within the substance misuse definition and, for the purpose of this Standard, is characterised by several of the following features:

- tolerance, as defined by either a need for markedly increased amounts of the substance to achieve intoxication or desired effect, or a markedly diminished effect with continued use of the same amount of substance; and
- withdrawal, as manifested by either the characteristic withdrawal syndrome for the substance, or the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms; and
- the substance is often taken in larger amounts or during a longer period of time than was intended; and
- there is a persistent desire or unsuccessful efforts to cut down or control substance use; and
- a great deal of time is spent in activities to obtain the substance, use the substance or recover from its effects; and
- important social, occupational or recreational activities are given up or reduced because of substance use; and the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (e.g. continued drinking despite worsening a peptic ulcer; single or multiple convictions for drug and alcohol vehicle driving offences; marital discord and domestic violence, etc).

For the purpose of this Standard, remission / recovery is attained when there is abstinence from use of illicit drugs or where the use of other substances, such as alcohol, has reduced in frequency to the point where it is unlikely to cause impairment of pilotage work or to result in a positive test at work.

25.2 Interface with drug and alcohol management programs

The section should be read in conjunction with the requirements of the Port Authority drug and alcohol policy and program, which are governed by the NSW Marine Pilotage Code[22] and the Marine Safety Act[23].

The health assessment system for pilots described in this chapter is integral to the organisational management of drugs and alcohol. For example, it provides a mechanism by which a pilot may be referred for a Triggered Health Assessment if they are found to test positive to a drug and alcohol screen (random or for cause) or there are other circumstances that indicate a potential problem such as recurrent drink driving convictions. The assessment may result in specialist referral and more regular review as part of a rehabilitation / return to work process.

Periodic Health Assessments conducted under the Standard do not routinely include drug and alcohol screening, however the assessment incorporates a behavioural screen for heavy alcohol use (AUDIT) and a clinical assessment, with specialist referral if indicated.

For all assessments conducted under the Standard, if a person is suspected of being intoxicated by alcohol or drugs at the time of an assessment, the Authorised Health Professional should assess them and enquire about possible reasons for their condition. Under these specific circumstances, the doctor may conduct a drug and alcohol test in accordance with the Marine Safety Act. If drug or alcohol intoxication is suspected or confirmed, the Authorised Health Professional should categorise the pilot as Temporarily Unfit for Duty and notify the Port Authority.

Working restrictions (i.e. suspension of pilotage duties) following a positive drug screen are imposed as determined by operational procedures. Medical fitness for duty may only be determined as a result of a medical review process (refer to Figure 32).

25.3 Relevance to pilotage

25.3.1 Acute and long-term effects of alcohol and other drugs

Both the acute and chronic effects of substance misuse are relevant to safe pilotage.

Alcohol

The acute effects of alcohol are well established; its use is incompatible with the conduct of pilotage work as reflected in Marine Safety Act and the NSW Marine Pilotage Code.

Chronic heavy alcohol use carries a risk of neurocognitive deficits (Wernicke–Korsakoff syndrome) relevant to safe working capability, including:

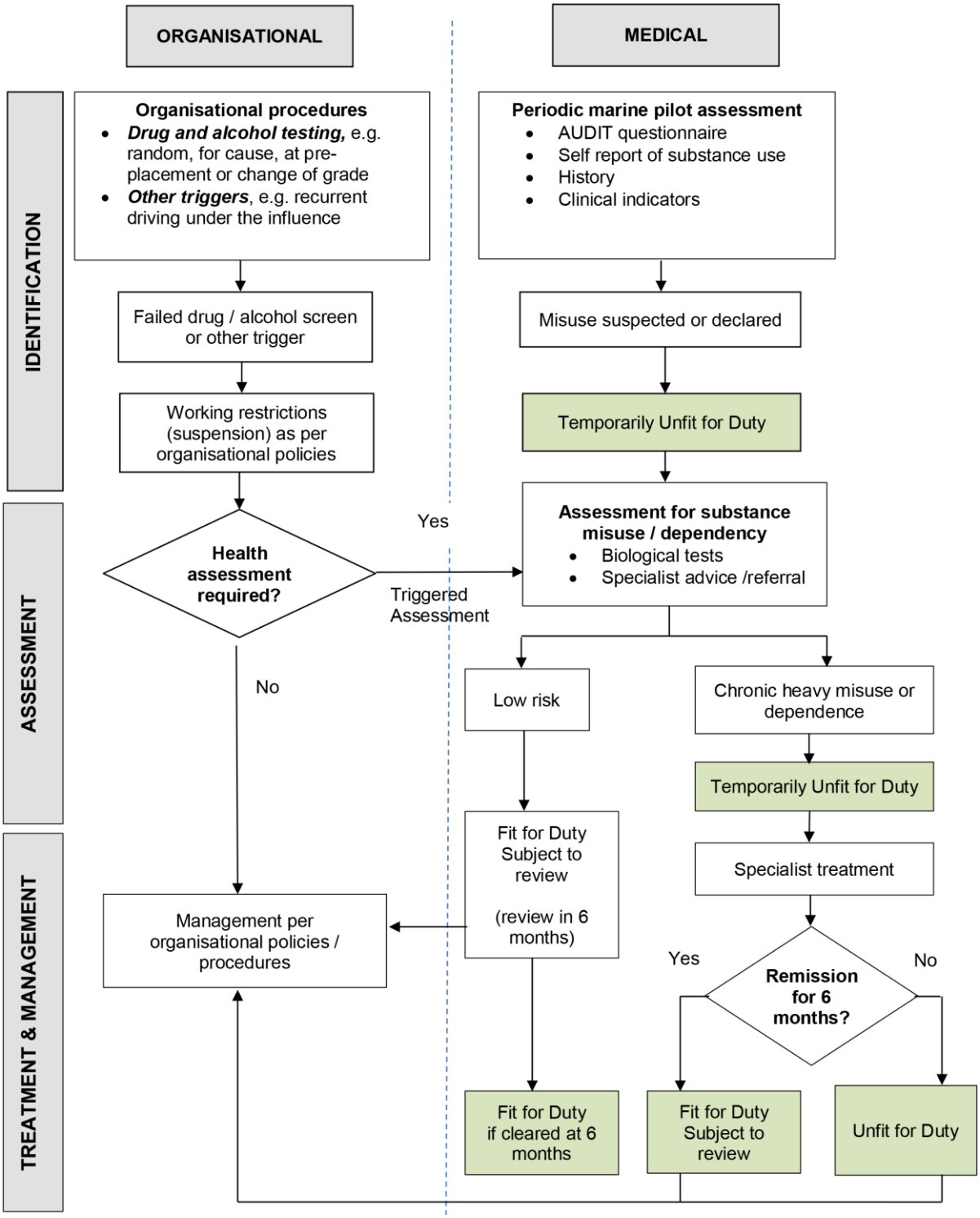
- short-term memory and learning impairments, which become more evident as the task difficulty increases;
- impaired perceptual–motor speed;
- impairment of visual search and scanning strategies; and

[22] New South Wales Marine Pilotage Code, October 2015

[23] Marine Safety Act 1998, as at 28 June 2016, http://www.austlii.edu.au/au/legis/nsw/consol_act/msa1998145/ [accessed 26 September 2016]

- deficits in executive functions such as mental flexibility and problem-solving skills; difficulty in planning, organising and prioritising tasks; difficulty focusing attention, sustaining focus, shifting focus from one task to another, or filtering out distractions; difficulty monitoring and regulating self-action; or impulsivity[24] .

Figure 32 Organisational and medical management of drug and alcohol misuse / dependence in marine pilots



[24] Charlton JL, et al. Influence of chronic illness on crash involvement of motor vehicle drivers, 2nd edn, Monash University Accident Research Centre, Melbourne. 2010

The effect on interpersonal skills and hence bridge resource management is a further consideration. Also, peripheral neuropathies experienced as numbness or paraesthesia of the hands or feet may occur and affect safety on the ladder.

In the event of the above end-organ effects relevant to safe working, the appropriate requirements should be applied as set out elsewhere in this publication.

Alcohol-dependent people may experience a withdrawal syndrome (delirium tremens) on cessation or significant reduction of intake, which carries some risk of generalised seizure (refer to 'Acute symptomatic seizures', Table 14), confusional states and hallucinations.

Of relevance to the management of pilots with alcohol dependence is that individuals with alcohol dependence have approximately twice the risk of (motor vehicle) crash involvement as controls. In addition, (vehicle) drivers with alcohol dependency are more likely to drive while intoxicated.

Other substances

Substances (prescribed, over-the-counter and illicit drugs) can be misused for their intoxicating, sedative or euphoric effects. Pilots who are under the acute influence of these drugs, or craving for them or withdrawing from them, are more likely to behave in a manner incompatible with safe working. This may involve, but is not limited to, risk taking, aggression, feelings of invulnerability, narrowed attention, altered arousal states and poor judgement.

The chronic effects of these substances vary and are not as well understood as those of alcohol. Some evidence suggests cognitive impairment is associated with chronic stimulant, opioid and benzodiazepine use. Those misusing these substances may be at risk of brain injury through hypoxic overdose, trauma or chronic illness.

Withdrawal symptoms can also vary and may include restlessness, insomnia, anxiety, aggression, anorexia, muscle tremor and autonomic effects.

End-organ damage, including cardiac, neurological and hepatic damage, may be associated with some forms of illicit substance use, particularly injection drug use. Cocaine and other stimulant misuse have been linked with cardiovascular pathology. In the event of end-organ effects relevant to pilotage, the appropriate requirements should be applied as set out elsewhere in this publication.

Withdrawal seizures may occur (refer to 'Acute symptomatic seizures', Table 14).

Opioid analgesics for pain management

The long term use of opioid analgesics is generally not accepted as an appropriate approach for chronic musculoskeletal pain management and therefore should be questioned. Pilots using these agents should be referred for assessment by an appropriate specialist such as an orthopaedic surgeon or rheumatologist or if appropriate an addiction medicine specialist or addiction psychiatrist.

25.3.2 Effects of alcohol or drugs on other diseases

People who are frequently intoxicated and who also suffer from certain other medical conditions are often unable to give their other medical problems the careful attention required, which has implications for safe working.

Epilepsy

Many people with epilepsy are quite likely to have a seizure if they miss their prescribed medication even for a day or two, particularly when this omission is combined with inadequate rest, emotional turmoil, irregular meals, and alcohol or other substances. Pilots under treatment for any kind of epilepsy are not fit for duty if they are frequently intoxicated.

Diabetes

People with insulin-dependent diabetes have a special problem if they are frequently intoxicated. Not only might they forget to inject their insulin at the proper time and in the proper quantity, but their food intake can also get out of balance with the insulin dosage. This may result in a hypoglycaemic reaction or the slow onset of diabetic coma. Such pilots would not be fit for duty.

25.4 General assessment and management guidelines

The key consideration is to ensure pilots with suspected or confirmed substance misuse problems do not present a risk to safety during pilotage, either from being acutely affected, or affected by the consequences of chronic use and/or withdrawal.

The flow chart shows the steps of identification, assessment and treatment in the management of substance misuse and dependence, and also shows the interface between organisational approaches and pilot health assessments.

25.4.1 Identification

Screening tests may be useful for identifying substance misuse and dependence disorders. For example, the Alcohol Use Disorders Identification Test (AUDIT) is used to screen for risk of hazardous alcohol use, high risk or harmful alcohol use and alcohol dependence, and is included in the Health Questionnaire (Pink Form). Details of application and interpretation of the score are provided on page 187. The AUDIT relies on accurate responses to the questionnaire, and should be interpreted in the context of a global assessment that includes other clinical evidence. If the person appears unduly familiar with the AUDIT, other validated questionnaires may be applied and clinical judgement may be needed.

25.4.2 Assessment

Careful individual assessment must be made of pilots who misuse or are suspected of misusing alcohol or other substances (prescribed or illicit), even if drug use is occasional. Assessment will require consideration of the pilot's substance use history, work attendance and performance records, response to any previous treatment and their level of insight.

During clinical assessment, patients may understate or deny substance use for fear of consequences of disclosure. In addition, the acute and chronic cognitive effects of some substance use also contribute to difficulty in obtaining an accurate history and identification of substance use. Assessment should therefore incorporate a range of indicators of substance use in addition to self-reporting, examination for stigmata (for example needle tracks, spider angioma, enlarged liver), and tests, for example, carbohydrate deficient transferrin (CDT) and liver function tests (LFT) for alcohol misuse, or drug metabolites and hair analysis for drug misuse.

Examining health professionals should be mindful that misuse may not be confined to a single drug class, and people may use multiple substances in combination. In addition, people who misuse substances may change from one substance to another. They should also be alert to the complex course of substance misuse; periods of abstinence for a number of months are a feature of dependence and should not be interpreted as sustainable recovery or as evidence that ongoing professional help is not required. Both dependence and recovery are best viewed as fluid rather than fixed states, thus underscoring the need for sustained and assertive recovery management.

Pilots who are found to be misusing or are suspected of misusing alcohol or drugs should be classed as Temporarily Unfit for Duty while their condition is being investigated.

Where dependence or chronic, heavy misuse is suspected by the Authorised Health Professional, the pilot should be referred to (or discussed with) a doctor experienced in managing substance misuse disorders, for example a psychiatrist specialised in alcohol and drug misuse or an addiction medicine specialist, to assist in determining the level of substance use and the level of safety risk. People with a combined substance misuse disorder and mental illness (‘dual diagnosis’) often have a level of complexity requiring specialist assessment.

25.4.3 Management and treatment

If the risk of further substance misuse has been assessed as low, a pilot should be categorised as Fit Subject to Review subject to further review in 6 months’ time and ongoing monitoring as per the Port Authority’s policy. They may be assessed as Fit for Duty at the 6 month review if there is no evidence of substance misuse.

Those assessed as having chronic or heavy substance misuse or dependence, should be categorised Temporarily Unfit for Duty until remission is achieved or otherwise. For the purposes of this document remission requires a strong response to treatment and well-documented abstinence which must be confirmed by biological monitoring (e.g. urine drug screening, LFT, CDT, hair analysis for drugs) over a period of at least 6 months. At the conclusion of any monitoring a pilot with remission may be certified Fit for Duty Subject to Review on a long term basis.

Pilots with severe substance misuse problems or dependence who have had previous high rates of relapse and fluctuation in stabilisation would not be considered fit to return to pilotage.

25.5 Medical criteria

Requirements for fitness for duty are outlined in Table 26.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person’s fitness for duty.

Table 26 Medical criteria for pilots – Substance misuse and dependence

Table 26 Medical criteria for pilots – Substance misuse and dependence	
Condition	**Criteria**
AUDIT Questionnaire	If the pilot has an AUDIT score of ≥ 8, the pilot may be categorised as Fit for Duty Subject to Review or Temporarily Unfit for Duty while causes are being assessed and managed (refer to Table 27). • Pilots with scores of 8–15 may be managed within the consultation by providing simple advice and information on the alcohol guidelines and risk factors. If the risk is assessed as being low, they should be categorised as Fit for Duty Subject to Review. • Pilots with scores of 16–19 should be managed by a combination of simple advice, brief counselling and continued monitoring. Follow-up and referral to the pilot's general practitioner is necessary. They should be categorised as Fit for Duty Subject to Review or Temporarily Unfit for Duty pending further assessment. • Pilots with scores of 20 or more should be referred to specialist services to consider withdrawal, pharmacotherapy and other more intensive treatments. They should be assessed as Temporarily Unfit for Duty pending further assessment.
Substance misuse	A pilot is not Fit for Duty Unconditional: • If there is evidence of substance misuse. The pilot should be categorised Temporarily Unfit for Duty while being assessed and managed. Fit for Duty Subject to Review may be determined, with review in 6 months: • if the risk of further substance misuse is assessed as being low. Fit for Duty may be determined if there is no evidence of substance misuse at the 6 month review. In the case of chronic or heavy substance misuse or substance dependence, Fit for Duty Subject to Review may be determined, subject to at least annual review, taking into account the nature of the work and information provided by an appropriate specialist (such as an addiction medicine specialist or addiction psychiatrist) as to whether the following criteria are met: • the pilot is involved in a treatment program and has been in remission* for at least 6 months as confirmed by biological monitoring; and • the pilot has the mental capacities (cognition, communication skills and ability to respond in emergency situations) required for safe working; and • there is absence of end-organ effects that impact on safe working (as described elsewhere in this Standard); and • the risk of further substance misuse is assessed as being low. * Remission is defined in the text (refer to Section 25.4.3 Management and treatment)

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

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Box 2 Audit Questionnaire

The Alcohol Use Disorders Identification Test (AUDIT) was developed by the World Health Organization (WHO) as a simple method of screening for excessive alcohol consumption. It provides a framework for intervention to help at-risk or high-risk drinkers to reduce or cease their alcohol consumption. It also helps to identify alcohol dependence.

The AUDIT is included in the *Health Questionnaire For Marine Pilots* to help identify patterns of alcohol use that may impact on their pilotage work. Identification of harmful alcohol consumption, as well as indicators of alcohol dependence, is therefore particularly important.

The periodic health assessment also provides an opportunity to counsel marine pilots about hazardous drinking patterns.

The AUDIT provides an accurate measure of risk across gender, age and cultures. Its validity, brevity and flexibility make it the most widely used screening instrument around the world.

The standard AUDIT has 10 questions to which there is a choice of up to 5 answers in a tick-a-box format.

The questions are designed to seek information in 3 domains as shown in Table 28.

Table 27 Audit Questionnaire

Table 27 Audit Questionnaire

Please tick the answer that is correct for you:

Scoring:

	(0)	***(1)***	***(2)***	***(3)***	***(4)***
1. How often do you have a drink containing alcohol?	☐ Never (skip to Q9)	☐ Monthly or less	☐ 2 to 4 times a month	☐ 2 to 3 times a week	☐ 4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	☐ 1 or 2	☐ 3 or 4	☐ 5 or 6	☐ 7, 8 or 9	☐ 10 or more
3. How often do you have 6 or more drinks on one occasion?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ Daily or almost daily
4. How often during the last year have you found that you were not able to stop drinking once you had started?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ 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?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ 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?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ Daily or almost daily
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ 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?	☐ Never	☐ Less than monthly	☐ Monthly	☐ Weekly	☐ Daily or almost daily
9. Have you or someone else been injured as a result of your drinking?	☐ No		☐ Yes, but not in the last year		☐ Yes, during the last year
10. Has a relative or friend or a doctor or other health pilot been concerned about your drinking or suggested you cut down?	☐ No		☐ Yes, but not in the last year		☐ Yes, during the last year

Box 2 Audit Questionnaire

Table 28 Domains and item content of the AUDIT

Domains	Question No.	Item content
Risky or 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
High-risk or harmful alcohol use	7	Guilt after drinking
	8	Blackouts
	9	Alcohol-related injuries
	10	Others concerned about drinking

Definitions

Risky or hazardous alcohol use

Hazardous drinking is a pattern of alcohol consumption that increases the risk of harmful consequences for the user or others, including the risk of accidents, injuries and social problems.

High-risk or harmful alcohol use

Harmful use refers to alcohol consumption that results in long-term consequences to physical and mental health (e.g. gastritis, liver damage or depression).

Alcohol Dependence

Alcohol dependence is a cluster of behavioural, cognitive and physiological phenomena that may develop after repeated alcohol use. Typically, these include a strong desire to consume alcohol, impaired control over use, persistent drinking despite harmful consequences, a higher priority given to drinking than to other activities and obligations, increased alcohol tolerance and physical withdrawal reaction.

Use of the AUDIT for marine pilots

The purpose of applying the AUDIT to marine pilots is to ensure that individuals are not impaired at work, either by the direct effects of alcohol or the health and/or social problems associated with alcohol use.

The examining health professional is required to evaluate the responses to the questionnaire in conjunction with results of the clinical examination, and form a view as to whether they believe there is a significant current risk that the pilot might be impaired at work, either by the direct effects of alcohol, or by associated health or social problems.

Note that it is possible to accumulate 8 or more points as a result of binge drinking on days off, or highlight excessive drinking in the past, without necessarily being at risk of being impaired at work. The health assessment does, however, provide a valuable opportunity to provide brief advice about risky alcohol consumption.

Note also that through separate drug and alcohol policies and procedures, Marine pilots may be subject to random testing by their operator. Marine pilots are also liable for testing following incidents, and may be prosecuted by the police if alcohol is detected while working.

Administering the AUDIT

In the pilots' health assessment, the *AUDIT Questionnaire* is administered in a self-report format; however, it can also be administered by interview if necessary. The cognitive capacities (e.g. literacy, forgetfulness) and the level of cooperation or defensiveness of the pilot should be considered in selecting the appropriate format.

Dishonest completion is believed to be an issue among pilots, so review of the responses with the pilot is desirable. It may be helpful to reassure the pilot that all responses are confidential and are not forwarded to the operator.

Box 2 Audit Questionnaire

Scoring the AUDIT and managing Marine pilots

Each of the questions has a range of responses, and each response has a score ranging from 0 to 4. Questions are scored for the response from left to right. A total score of 40 is possible.

Higher scores indicate a greater likelihood of hazardous or harmful drinking, and reflect a greater severity of alcohol problems and dependence, as well as a greater need for more intensive treatment.

AUDIT results are categorised into particular risk levels (or 'zones') to guide the appropriate intervention. Table 29 illustrates the general guidelines for World Health Organisation (WHO) assignment of risk levels based upon AUDIT scores and describes the intervention appropriate to that level.

Table 29 AUDIT risk levels

Risk level	Intervention	AUDIT score
Zone I	Alcohol education	0–7
Zone II	Simple advice	8–15
Zone III	Simple advice plus brief counselling and continued monitoring	16–19
Zone IV	Refer for diagnostic evaluation and treatment	20–40

Risk Zone I – AUDIT scores between 0 and 7

This score generally indicates low-risk drinking. Although no formal intervention is required, alcohol education is appropriate for the following reasons:

- it contributes to the general awareness of alcohol risks and the relevance to pilotage work
- it may be effective for pilots who have experienced alcohol problems but who have already reduced their drinking levels, or whose circumstances may change
- it could be effective for those pilots who have minimised the extent of their drinking on the AUDIT questions.

Risk Zone II – AUDIT scores between 8 and 15

Scores in this zone are likely to be recorded by a significant proportion of pilots. They indicate alcohol use in excess of the low-risk guidelines.

People in Zone II would generally be drinking at risky or hazardous levels, and would be at moderate risk of alcohol-related harm. This zone, however, may also include pilots experiencing actual harm and low levels of dependence. Generally, simple advice and information on the alcohol guidelines and risk factors, and the importance of attentiveness for pilotage work, would be an appropriate intervention.

The examining health professional may assess the pilot as Fit for Duty Subject to Review to flag the issue for attention at subsequent assessments. The period of review may be earlier than or in line with normal periodic frequencies, depending on the clinical assessment and other indicators.

Risk Zone III — AUDIT scores between 16 and 19

This zone indicates risky drinking and problems related to higher levels of consumption. This score indicates a pattern of consumption that is already causing harm to the drinker who may also have symptoms of dependence. Pilots in this zone should be managed by a combination of simple advice, brief counselling and continued monitoring. Follow-up and referral to the pilot's general practitioner is necessary.

The examining health professional should assess the pilot as Fit for Duty Subject to Review and should refer for external assessment via the pilot's general practitioner. They may also classify as Temporarily Unfit for Duty if there are immediate concerns for safe conduct of safety critical tasks.

Risk Zone IV — AUDIT scores in excess of 20, and where combined scores on questions 4, 5 and 6 are ≥ 4

Scores in this zone indicate that the person falls into the high-risk category of alcohol-related harm. Pilots in this zone are likely to be alcohol dependent and require more intensive intervention. Health professionals should note that dependence varies along a continuum of severity and might be clinically significant at lower AUDIT scores.

Pilots in this zone should be referred to specialist services to consider withdrawal, pharmacotherapy and other more intensive treatments. They should be assessed as Temporarily Unfit for Duty pending further assessment and referred in the first instance to their general practitioner.

Steps in identifying a drinking problem

If a person has a total score of ≥ 8 on the *AUDIT Questionnaire*, the following additional steps are recommended:

1. Check the accuracy of the high scoring questions with the pilot.
2. Ask some additional questions to help determine the person's potential for alcohol dependence. The following question may be helpful to confirm accuracy and obtain more information:
   How many drinks did you have on your last drinking day—and on the previous occasion?
   (this is a good guide to the usual intake).

26 Vision and eye disorders

26.1 Relevance to marine pilots

Good vision is essential to pilotage. The pilot is required to accurately see objects at near, intermediate and far distances. They require a full field of vision for early detection of approaching ships and other potential hazards. Pilots work at night and may be subject to extremes of darkness and light around docks; therefore good dark adaptation is required.

Good colour vision is needed for maritime navigation which requires accurate recognition of red, green and other coloured lights on other ships and navigation lights on sea and land at night. Accurate recognition of a red or a green light on another vessel gives information regarding its course and the likelihood of a collision. Good acuity is required for good colour vision because poor visual acuity spreads the light on the retina making recognition of small or distant signal lights more difficult.

A significant defect in any of these aspects of a pilot’s visual capacities may endanger the pilotage.

26.2 General assessment and management guidelines

There may be a degree of flexibility allowed at the optometrist's or ophthalmologist's discretion for individuals who barely meet visual criteria but who are otherwise alert and have normal reaction times.

The important aspects of vision in relation to marine piloting are visual acuity, visual fields and colour vision.

26.2.1 Visual acuity (near and far)

For the purposes of this Standard, visual acuity may simply be defined as the best obtainable vision with or without glasses or contact lenses. Visual acuity initially should be measured with one eye occluded and without correction. If correction is normally used when working then vision should be retested with corrective lenses and the corresponding results recorded. Acuity should be tested using an appropriate visual acuity chart (Snellen Chart or equivalent).

Near vision is tested for both eyes without correction in the first place and then retested with correction if worn. Testing should be at N8 of a Times Roman chart placed at 40cm distance. The text should be read fluently.

Persons who require corrective spectacle lenses or contact lenses to perform duties should be classed as Fit for Duty conditional upon wearing corrective lenses and periodic review. If pilots meet the criteria with corrective lenses they should be able to be passed by the Authorised Health Professional without reference to an ophthalmologist, optometrist or general practitioner. In appropriate circumstances a referral may be made.

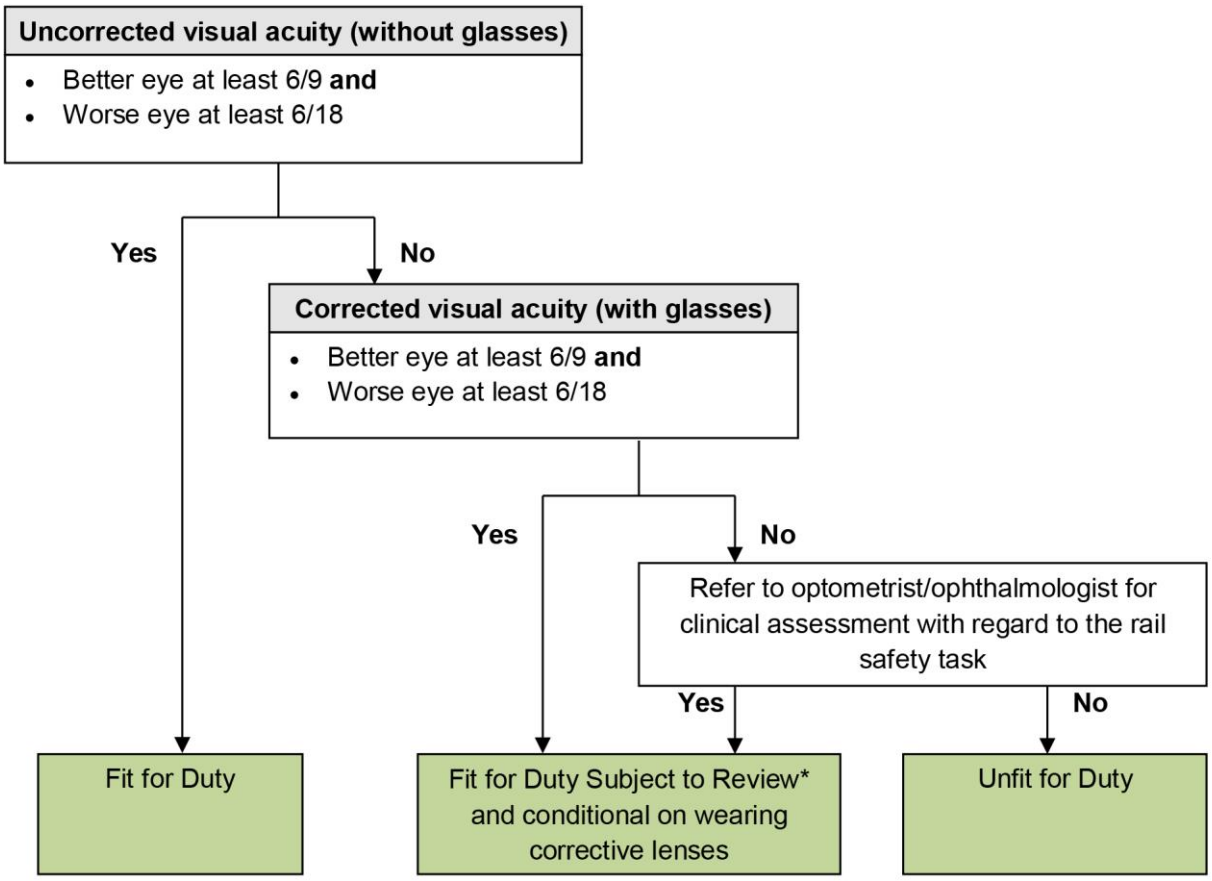
NOTE: It is not required that pilots with glasses carry spare sets of glasses at work. However when glasses are worn they should have a neckband to avoid loss. Persons who wear contact lenses must carry a spare set of glasses in case a foreign body enters the eye (so requiring removal of the lens).

Where glasses are prescribed the prescriber should take into account the need for vision at near, intermediate and far distances and consider multi-focal or bifocal lenses.

Photochromic Lenses, Polarised Lenses and Dark Adaptation

The Australian Maritime Safety Authority has issued a warning that photochromic and polarized lenses are unsuitable for duties at night sleep *(AMSA 2012)*. The examining doctor and the pilot will need to convey this information to the ophthalmologist or optometrist if a pilot is referred for assessment.

Figure 33 Visual acuity requirements for marine pilots



* Specialist review is not required for stable ophthalmic conditions. Pilots may not require more frequent review, but their vision should be specifically reviewed at the next periodic assessment.

26.2.2 Visual fields

Adequate visual fields are important for marine piloting.

Visual field losses also occur in eye diseases such as retinitis pigmentosa, a not uncommon inherited degeneration of the retina that causes significant visual field loss by the age of 30. Conditions such as glaucoma, optic atrophy, retinal detachment and localised retinal or choroidal infection, and laser treatment of diabetic retinopathy can also reduce visual fields. Good rotation of the neck may also be necessary to ensure adequate overall fields of vision. (Refer to Section 20 Musculoskeletal disorders).

Visual fields may be initially screened by confrontation. Any person who has or is suspected of having a visual field defect should be referred for expert assessment by an optometrist or ophthalmologist.

Monocular automated static perimetry is the minimum baseline standard for visual field assessments. If monocular automated static perimetry shows no visual field defect, this information is sufficient to confirm that the standard is met.

Subjects with any significant field defect or a progressive eye condition require a binocular Esterman visual field for assessment. This is classically done on a Humphrey visual field analyser but any machine that can be shown to be equivalent is accepted. This must be performed with fixation monitoring. Alternative devices must have the ability to monitor fixation and to stimulate the same spots as the standard binocular Esterman. For an Esterman binocular chart to be considered reliable for fitness for duty, the false positive score must be no more than 20 per cent.

Horizontal extent of the visual field

A single cluster of up to three adjoining missed points, unattached to any other area of defect, lying on or across the horizontal meridian will be disregarded when assessing the horizontal extension of the visual field. A vertical defect of only a single point width but of any length, unattached to any other area of defect, which touches or cuts through the horizontal meridian may be disregarded**.** There should be no significant defect in the binocular field which encroaches within 20 degrees of fixation above or below the horizontal meridian. This means that homonymous or bitemporal defects that come close to fixation, whether hemianopic or quadrantanopic, are not normally accepted.

Central field loss

Scattered single missed points or a single cluster of up to three adjoining points is acceptable central field loss for a person to be fit for duty. A significant or unacceptable central field loss is defined as any of the following:

1. A cluster of four or more adjoining points that is either completely or partly within the central 20 degree area.
2. Loss consisting of both a single cluster of three adjoining missed points up to and including 20 degrees from fixation, and any additional separate missed point(s) within the central 20 degree area.
3. Any central loss that is an extension of a hemianopia or quadrantanopia of size greater than three missed points

Binocular vision is required for all marine piloting.

26.2.3 Dark adaptation

Health professionals may wish to recommend restrictions on pilots who appear to meet the visual criteria in the clinical setting but may, in certain environments, have extreme difficulty. Certain disorders or diseases such as retinitis pigmentosa can cause poor night vision. Examples of such restrictions might be daylight piloting only. Specialist referral may be considered.

26.2.4 Progressive eye conditions

Pilots with a progressive eye condition such as cataract, glaucoma, diabetic retinopathy, optic neuropathy and retinitis pigmentosa should be counselled that their eye condition will or may progress to a stage where they are no longer able to work. They should be encouraged to consider making lifestyle changes in anticipation of not being able to work. Their vision should be monitored regularly. Because persons with cataract suffer loss of contrast sensitivity and greater sensitivity to glare, they may have more difficulty seeing when working than is indicated by their visual acuity.

26.2.5 Congenital and acquired nystagmus

The criteria for visual acuity must be met and any underlying condition fully assessed.

26.2.6 Diplopia

Pilots suffering from all forms of diplopia generally are unsafe to pilot ships and climb ladders. Any person who reports or is suspected of experiencing diplopia should be referred for expert assessment by an optometrist or ophthalmologist. They should be classed as Temporarily Unfit for Duty pending review.

26.2.7 Colour vision

Colour vision should be first assessed with the Ishihara plates. No coloured lenses or sunglasses should be worn. A pass is no more than 3 errors in 12 screening plates of the 24 plate edition (Colour Vision Normal). In the event of a fail the person may be further assessed using the Holmes Wright Lantern Type B. These lanterns may be available at specialised clinics or at university departments of optometry. For details of Lantern test refer overleaf.

26.3 Medical criteria

Medical criteria for fitness for duty are outlined in Table 30.

It is important that health professionals familiarise themselves with both the general information above and the tabulated criteria before making an assessment of a person's fitness for duty.

Table 30 Medical criteria for marine pilots – Vision and eye disorders

Table 30 Medical criteria for marine pilots – Vision and eye disorders	
CONDITION	**CRITERIA**
Acuity (far)	Far visual acuity should be measured one eye at a time (monocularly), without correction. Acuity should be tested using a standard visual acuity chart (Snellen Chart or equivalent) that includes at least five letters on the 6/6 and 6/18 lines. More than two errors in reading the letters of any line is regarded as a failure to read the line. A pilot is not Fit for Duty Unconditional: • if the pilot's visual acuity is worse than 6/6 in the better eye; or • if the pilot's visual acuity is worse than 6/18 in either eye. Fit for Duty Subject to Review may be determined: • if the standard is met with corrective lenses (if the standard is met with corrective lenses, fitness for duty is conditional upon wearing these lenses – Fit for Duty Conditional); and • after consideration of the stability of any underlying disorder. Fit for Duty Subject to Review may be determined, taking into account the opinion of an ophthalmologist or optometrist: • if the pilot's vision is worse than 6/18 in the worse eye, provided that the visual acuity in the better eye is 6/6 or better (with or without corrective lenses); and • after consideration of the nature of any underlying disorder. In cases of latent nystagmus made manifest by the occlusion of one eye for the purpose of testing, a binocular visual acuity of 6/6 is acceptable if the visual acuity of the better eye is below 6/6 with occlusion of the fellow eye. The same minimum standard of vision in the worse eye applies.
Acuity (near)	Near vision should be measured without correction in the first place but using both eyes. The Times-Roman chart should be used at 40 cm. It should be read fluently to pass. A pilot is not Fit for Duty Unconditional: • if the pilot's near vision is worse than N8 at 40cm. Fit for Duty Subject to Review may be determined; • if the standard is met with corrective lenses; and • after consideration of the underlying disorder.
Diplopia	A pilot is not Fit for Duty Unconditional: • if the pilot experiences any diplopia (other than physiological diplopia) when fixating objects within 20^{o} of the primary direction of gaze.

Table 30 Medical criteria for marine pilots – Vision and eye disorders	
CONDITION	**CRITERIA**
Night blindness (Dark adaptation)	No specific criteria. Refer general management guidelines in text (Dark Adaptation).
Visual Fields	Visual fields may be initially screened by confrontation. Any person who has or is suspected of having a visual field defect should be referred for expert assessment by an optometrist or ophthalmologist. (Refer to text for details of testing). The pilot is not Fit for Duty Unconditional : • if the pilot has any visual field defect; or • if the pilot is monocular (see text). Fit for Duty Subject to Review may be determined subject to annual review, taking into account the nature of the work and work performance reports, and information provided by the treating optometrist or ophthalmologist as to whether the following criteria are met: • the binocular visual field has an extent of at least 140° within 10° above and below the horizontal midline; and • the pilot has no significant visual field loss (scotoma, hemianopia, quadrantanopia) that is likely to impede work performance; andthe visual field loss is static and unlikely to progress rapidly.
Colour vision	Colour vision should be screened using Ishihara plates. 4 or more errors in the 12 screening plates of the 24 plate edition is a fail. The person may be further assessed using Holmes Wright Lantern Type B (Refer to text for details of testing). A pilot is not Fit for Duty: if the pilot is a significant protan or deutan as determined by the Holmes Wright Lantern test.

Temporary illnesses. This Standard does not deal with the myriad of conditions that may affect health on a short-to-medium-term basis and for which a marine pilot may be referred for assessment regarding fitness to resume duty. Clinical judgement is usually required on a case-by-case basis, although the text in each section gives some advice on the clinical issues to be considered.

Undifferentiated illness. A marine pilot may present with symptoms that could have implications for their job, but the diagnosis is not clear. Referral and investigation of the symptoms will mean that there is a period of uncertainty before a definitive diagnosis is made, and before the pilot and Port Authority can be confidently advised. Each situation will need to be assessed individually, with due consideration being given to the probability of a serious disease that will affect pilotage work. Generally, pilots presenting with symptoms of a potentially serious nature should be categorised as Temporarily Unfit for Duty until their condition can be adequately assessed. However, they may be suitable for alternative duties. Pilots who are fit to continue work while being investigated should be categorised as Fit Subject to Review.

Specialist review. This Standard generally requires pilots who are assessed as Fit for Duty Subject to Review to be seen by a specialist leading up to their review appointment with the Authorised Health Professional. Any exceptions to this should be agreed with the examining specialist, treating general practitioner and Authorised Health Professional as clinically indicated. If this is agreed, a report from the treating general practitioner will suffice at the time of review by the Authorised Health Professional.

Test Procedure for the Holmes-Wright Lantern Type B

1. The examiner should have normal colour vision, and, prior to becoming a examiner using the Holmes-Wright Lantern Type B, have undergone a test using the Lantern as an observer.
2. The observer should wear his or her normal distance correction (glasses or contact lenses). This must be in untinted form.
3. The test is carried out in a dark room.
4. The observer is allowed 10 minutes to adapt to darkness.
5. The observer views the lantern at 6 metres, via a mirror if necessary.
6. Explain to the observer that in the first phase of the test he or she will be shown single lights which will be RED, WHITE or GREEN.
7. Set the selector switch on the back of the Lantern to large aperture. Move the selector slide on the side of the Lantern to show the following numerical codes in the window:

Code: 15 Say: '**This is RED**',

Code: 00 Say: '**This is WHITE**'

Code: 33 Say: '**This is GREEN**'.

8. With the selector switch on the back of the Lantern still set on large aperture, show the observer codes 50 through 17 for about 5 seconds each by moving the selector slider to the right (*ie clockwise)* and ask him or her to name the colours.
   Record the responses.
9. Explain to the observer that in the second phase of the test he or she will be shown pairs of lights which will be any combination of RED, WHITE or GREEN. Say that he or she will be asked to name the colours of the pairs of lights, with the colour of the left light being given first and then the right light.
10. Set the selector switch on the back of the Lantern to small aperture. Move the selector slide on the side of the Lantern to show the following numerical codes in the window:

Code: 00 Say: '**This is WHITE, WHITE**'

Code: 33 Say: '**This is GREEN, GREEN**'

Code: 55 Say: '**This is RED, RED**',

Code: 50 Say: '**This is WHITE, RED**'

Code: 01 Say: '**This is GREEN, WHITE**'

Code: 15 Say: '**This is RED, GREEN**'.

11. With the selector switch on the back of the Lantern still set on small aperture, show the observer the following sequences of the possible 9 pairs in order, each for about 5 seconds;
    Codes 50 through 17 moving the slide selector to the right *(ie clockwise)*
    Codes 17 through 50 moving the slide selector to the left *(ie anticlockwise)*
    Codes 50 through 17 (*i.e*. *clockwise)*
    Codes 17 through 50 (*i.e*. *anticlockwise)*
    Record the responses.
12. With the selector switch on the back of the Lantern still set on small aperture, show the observer the 9 pairs in random order, each for about 5 seconds. Record the responses.
13. If the observer misnames either or both colours in a pair, it is considered a single error.
14. Add the total number of errors on the 5 runs of 9 pairs of small aperture lights. (Disregard the errors on the large aperture lights.)
15. A total of 5 or less errors is considered a pass of the test.
16. Inform the observer of the result of the test, giving him or her the opportunity to repeat the whole test. 5 or less errors on the retest is considered a pass.

Results Sheet - Holmes-Wright Lantern - Type B

Observer..... …….. Examiner ..... Date .....

W = White R = Red G = Green

Large aperture – DO NOT COUNT IN TOTAL SCORE

Code (C)	Correct Response (CR)	Response (R)
50	W	
15	R	
00	W	
33	G	
01	G	
55	R	
53	G	
11	G	
17	R	

Small aperture Run 1 Run 2 Run 3 Run 4 Run 5

Clockwise			**Anti-clockwise**			**Clockwise**			**Anti-clockwise**			**Random**		
C	**CR**	**R**	**C**	**CR**	**R**	**C**	**CR**	**R**	**C**	**CR**	**R**	**C**	**CR**	**R**
50	WR		50	WR		50	WR		50	WR		50	WR	
15	RG		15	RG		15	RG		15	RG		15	RG	
00	WW		00	WW		00	WW		00	WW		00	WW	
33	GG		33	GG		33	GG		33	GG		33	GG	
01	GW		01	GW		01	GW		01	GW		01	GW	
55	RR		55	RR		55	RR		55	RR		55	RR	
53	GR		53	GR		53	GR		53	GR		53	GR	
11	GG		11	GG		11	GG		11	GG		11	GG	
17	RG		17	RG		17	RG		17	RG		17	RG	

Total Errors on small aperture runs:

Run 1		+ Run 2		+ Run 3		+ Run 4		+ Run 5		=	

Result: PASS/FAIL

(5 or less total errors in 5 runs is considered a pass.)

Examiner's signature: ……

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APPENDIX 1. MODEL FORMS

Model forms are provided to facilitate implementation of the health assessments for marine pilots. Individual forms can be downloaded from the Transport for NSW website https://www.freight.transport.nsw.gov.au/network/NSW-port-network/ports-legislation/marine-pilotage-code

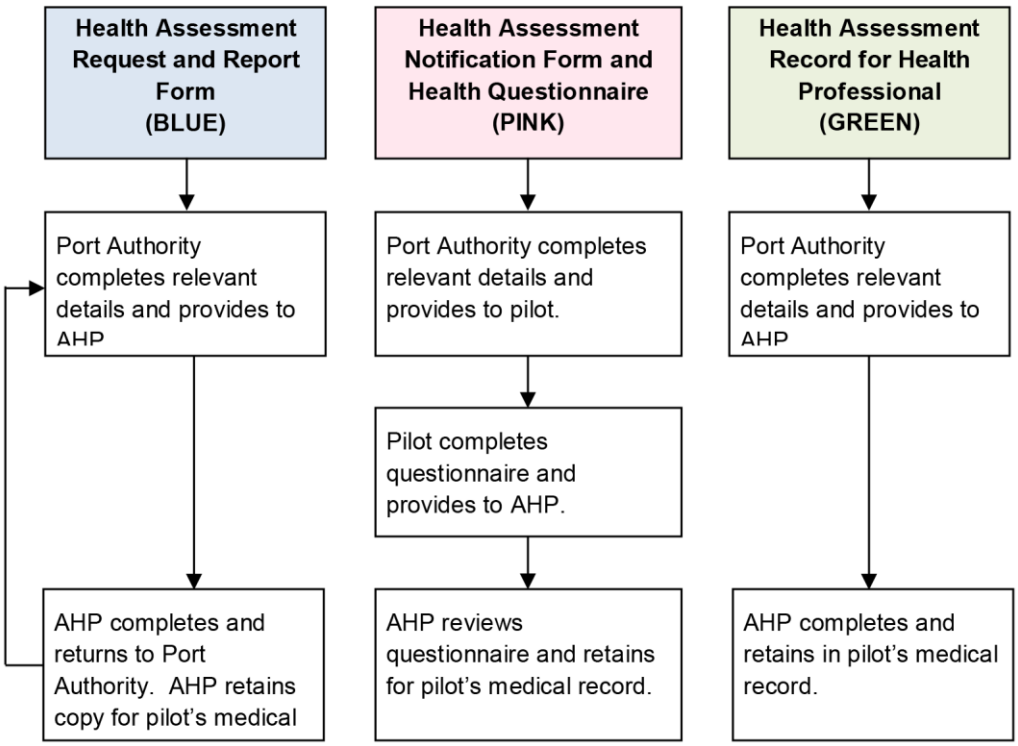
1 Request and Report Form (Blue Form)

The Request and Report form is the key means of communication between the Port Authority and the Authorised Health Professional.

The form is used as follows:

1. **Part A:** The Port Authority completes PART A, encloses copies of relevant supporting information (e.g. previous Health Assessment Report, sick leave summary (if applicable), relevant pilot's compensation reports or relevant incident reports) and a copy of the Health Professional Record (Green Form), and forwards them to the Authorised Health Professional.
2. **Part B:** Upon completion of the assessment, the health professional completes PART B of the form, retains a copy and returns the original form to the Port Authority.
3. **Part C:** The Port Authority completes PART C of the form to indicate the action taken as a result of the assessment. The Port Authority files the form in the pilot's personnel record.

Figure 34 Use of health assessment forms



Pilot name:

Name of Port Authority:

Marine Pilot Health Assessment
Request and Report Form

BLUE FORM

CONFIDENTIAL:

THE COMPLETED FORM SHOULD BE RETURNED TO THE PORT AUTHORITY
A COPY SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL

Instructions to the Authorised Health Professional

- You are requested to conduct a health assessment to assess the marine pilot's fitness for duty according to the details provided in PART A of this form and according to the *Standard for Health Assessment of Marine Pilots NSW.*
- You must sight photo identification of the pilot/applicant (e.g. driver's licence).
- Please perform the assessment, complete PART B of this form and return the whole form to the Port Authority according to instructions noted in PART A below, within 7 days of the assessment, OR should the marine pilot be assessed Unfit for Duty, please contact the Port Authority immediately by phone so that appropriate rostering changes may be made. Please keep a copy of this form for your own records.
- Marine pilots are required to present for fasting cholesterol (total and HDL), HbA1c and an ECG and VO_2 max for Initial Licensing and Periodic Health Assessments. Results will be forwarded to you directly.
- Marine pilots are required to have audiometry for Initial Licensing and Periodic Health Assessments. This will be arranged separately if audiometry facilities are not available at your practice.
- You may need to contact the marine pilot's nominated doctor to discuss conditions that may affect their fitness for duty. Such contact should be made with the pilot's signed consent (see GREEN FORM).
- Details of the examination should be recorded on the enclosed Health Assessment Record (GREEN FORM). This record is confidential and should be retained by you, not returned to the Port Authority.
- For more detailed information about the conduct of health assessments for marine pilots see the *Standard for Health Assessment of Marine Pilots NSW.*

Pilot name:

PART A – Request for Health Assessment – Port Authority to complete

A health assessment is requested to assess fitness for marine piloting duties (refer Inherent Requirements, Part C, *Standard for Health Assessment of Marine Pilots NSW.*

Date of request:

1. Port Authority details

Port Authority:

Supervisor / contact:

Phone: Facsimile:

Email:

Account and report to be sent to Supervisor at the following address *(please insert postal address or fax no.)*

2. Pilot / Applicant details

Family name: First names:

Employee no.: Date of birth:

3. Health assessment appointment details

Doctor / practice:

Address: Phone:

Appointment date: Time:

Pilot name:

4. Supporting information relevant to the assessment (tick information provided)

- ☐ Previous health assessment report(s). This is the Blue Form relating to the previous assessment
- ☐ Other *(specify – for example relevant sick leave or accidents since last periodic assessment)*

IMPORTANT: The examining Authorised Health Professional should also have access to the full health assessment clinical report (Green Form) from the previous assessment, which should be on their files. If it is not on their files, a copy should be sought from the health professional conducting the previous assessment to ensure continuity.

5. Assessment required

- ☐ Initial licensing Health Assessment
- ☐ Triggered Health Assessment *(provide details below)*
- ☐ Periodic Health Assessment
- ☐ Other *(provide details below)*

Please provide details of reasons for Triggered Health Assessment and/or any other assessment requirements

6. Tests required (Port Authority to tick)

The following tests are required for all Initial Licensing and Periodic Health Assessments.

They are not routinely required for Triggered Health Assessments.

- ☐ Fasting cholesterol (total and HDL)
- ☐ Plasma HbA1c (fasting not required but will be taken at the same times as cholesterol)
- ☐ Resting ECG
- ☐ Audiometry
- ☐ VO_2 max

Pilot name:

PART B: Health Assessment Report – Authorised Health Professional to complete

☐ I have sighted the marine pilot's photo ID (e.g. driver's licence, passport) Number:

☐ I have sighted the previous health assessment clinical report (Green Form)

I certify that I have examined the marine pilot in accordance with the *Transport for NSW Standard for Health Assessment of Marine Pilots* and in my opinion the marine pilot is (tick one box only):

☐ **Fit for Duty – Unconditional**

Meets all medical criteria for marine piloting

☐ **Fit for Duty – Conditional**

- ☐ Conditional on corrective lenses being worn
- ☐ Conditional on hearing aid being worn
- ☐ Other condition *(specify below)*

☐ **Fit for Duty Subject to Review**

Does not meet all medical criteria, but could perform marine piloting work if the condition is sufficiently under control and pilot is more frequently reviewed than prescribed under periodic review.

NOTE: A new recruit may be judged Fit for Duty Subject to Review and recommended for more frequent medical assessment from commencement of employment.

I recommend

- ☐ Review at this practice

Date of review

- ☐ Specialist referral
- ☐ Local doctor referral
- ☐ Laboratory test

☐ **Fit for Duty Subject to Job Modification**

Does not meet all medical criteria, but could perform marine piloting work if suitable job modifications were made.

I recommend the following job modifications (including timeframes):

☐ **Temporarily Unfit for Duty**

Does not meet all medical criteria and cannot perform marine piloting tasks as set out in the Inherent Requirements. May perform alternative tasks. May return to full duty pending: improvement in condition; response to treatment; confirmed diagnosis of undifferentiated illness.

NOTE: A new recruit may be judged Temporarily Unfit for Duty.

The Port Authority may advise of the opportunity for a renewed application upon the medical issues being resolved.

I recommend the following in terms of investigation, management and review (including timeframes):

☐ **Permanently Unfit for Duty**

Does not meet the medical criteria for marine piloting duties and cannot perform marine piloting tasks in the foreseeable future (> 12 months).

I recommend the following in terms of management and review (including timeframes):

Health professional details *(stamp acceptable)*

Name:

Address:

Phone:

Fax:

Assessment date:

Signature:

PART C. Operator to complete on receipt of Assessment Report

- ☐ Periodic Health Assessment scheduled as per Standard
- ☐ Job modification
- ☐ Triggered review
- ☐ Job modification
- ☐ Drug assessment

2 Pilot Notification and Health Questionnaire (Pink Form)

This form contains the notification to the pilot and the Health Questionnaire.

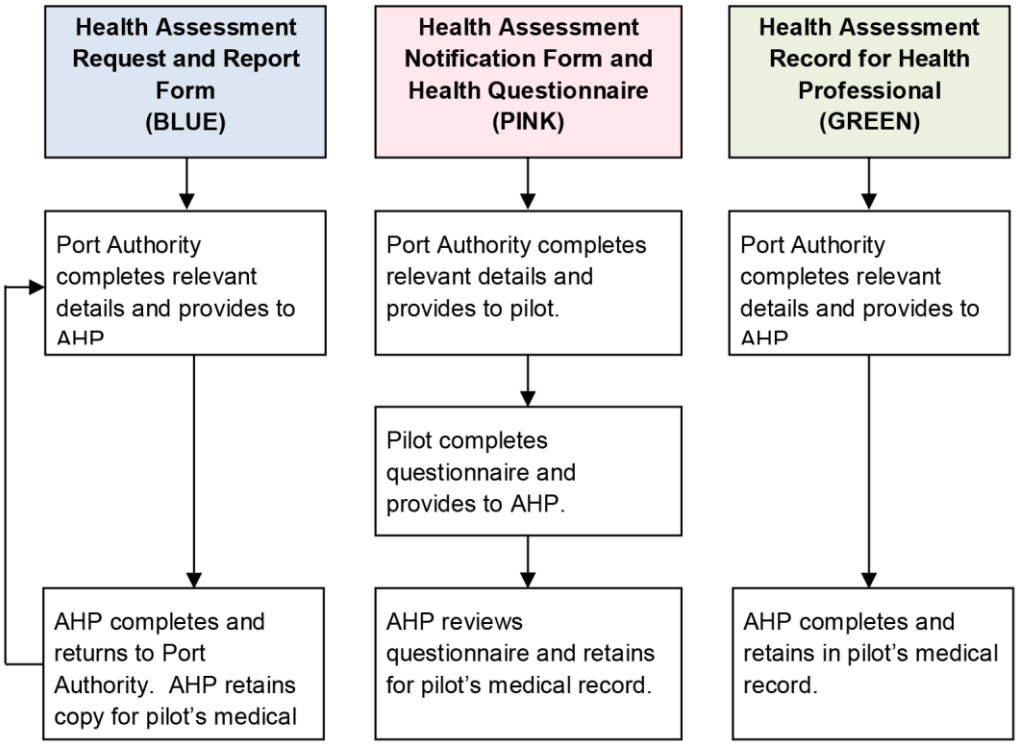
The self-administered questionnaire is a screening tool to help identify conditions that might affect the performance of marine pilots. The questionnaire is not a diagnostic tool and no decision can be made regarding the pilot's fitness for duty until the full clinical examination is performed.

Pilots are required to sign the completed questionnaire in the presence of the Authorised Health Professional to attest to the correctness of the information provided. The health professional should countersign.

The form is used as follows:

1. **Part A:** The Port Authority requests that the pilot/applicant sign the front of the form to indicate that they have read and understood the statements concerning the health information to be provided. The Port Authority completes PART A including appointment details and instructions to the pilot/applicant.
2. **Part B:** The pilot/applicant completes PART B and presents to the Authorised Health Professional. The pilot/applicant signs the form as a true statement and the health professional countersigns.
3. The Authorised Health Professional discusses the results with the pilot/applicant as appropriate. The form is retained by the health professional and filed in the pilot's medical record.

Use of health assessment forms



Pilot name:

Name of Port Authority:

Marine Pilot Health Assessment
Pilot Notification and Health Questionnaire

PINK FORM

CONFIDENTIAL:

FOR PRIVACY REASONS THE COMPLETED FORM SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL AND NOT RETURNED TO THE PORT AUTHORITY

Instructions for the pilot / applicant

- You are required to attend a health assessment as part of your employment, to assess your fitness for marine piloting duties.
- The health assessment must be completed by (date) to ensure that you are able to carry out normal duties.
- Complete the enclosed questionnaire before attending the appointment and provide it to the examining health professional. **The last page of the questionnaire must be signed by you in the presence of the examining doctor.**
- Please take to the appointment:
  - glasses, hearing aid or any other aids required for conduct of your work;
  - all medication that you are currently taking or a list of such medications;
  - any management plans relevant to an existing health condition (e.g. diabetes management plan); and
  - photo identification
- You will be required to have a blood test as part of your assessment. So as to get a true reading you should not eat for a minimum of 8 hours (and no longer that 14 hours) before your blood test appointment. You may drink water but you should not have sweetened drinks or juice.

What happens if the examining doctor suspects there is a health problem?

If the examining doctor finds or suspects something is wrong with your health that you did not know about, they will ask your permission to inform your own doctor. The examining doctor will not treat any medical condition but will give you a letter to take to your own doctor.

If the doctor finds that you do not meet all relevant medical criteria, your supervisor at the Port Authority will discuss with you the appropriate actions to be taken. This may include modification of the duties that you undertake for the Port Authority; and/or scheduling of a further review, tests of specialist referral.

Disclosure of health information – please read carefully and sign to indicate you understand how health information is reported, stored and accessed.

The details of your health assessment will remain confidential and will only be reported to your Port Authority in terms of your fitness for duty. The examining doctor retains all detailed medical papers including your questionnaire responses, test results and the completed record of clinical findings. The examining doctor sends the completed 'Request and Report Form: Marine Pilot Health Assessment' directly to the Port Authority indicating your fitness or otherwise for duty.

Other than the above, no information will be disclosed to any other person or organisation without your written permission, except where:

- a notifiable disease is diagnosed which must, by law, be reported to the State authorities;
- a report is subpoenaed by a court of law; or
- Transport for NSW (or another state or federal agency) is required to conduct an inquiry into an accident or incident; or
- Transport for NSW appoints a doctor to conduct a medical audit or an auditor to conduct an administrative audit.

You have the right to access your health records including those held by the Authorised Health Professional and the reports held by the Port Authority.

Pilot's declaration

I, *(print name)*

certify that I have read and understood the above statement concerning the health information provided in this document.

Signature: Date:

Pilot name:

PART A – Port Authority to complete

Date of request:

1. Pilot / Applicant details

Family name: First names:

Employee no.: Date of birth:

2. Port Authority details

Port Authority:

Supervisor / contact:

Phone: Facsimile:

Email:

3. Health assessment appointment details

Doctor / practice:

Address: Phone:

Appointment date: Time:

PART B – Marine Pilot Health Questionnaire – Pilot to complete

This questionnaire must be completed in order to help assess your fitness for marine piloting duties. Please answer the questions by ticking the appropriate box or circling the appropriate response. If you are not sure, leave the question blank and ask the examining health professional what it means. The health professional will ask you more questions during the assessment.

		Doctors comments
1. Are you currently attending a health professional for any illness or injury?	☐ No ☐ Yes	

2. Do you suffer from or have you ever suffered from:		Doctors comments
High blood pressure	☐ No ☐ Yes	
Heart disease	☐ No ☐ Yes	
Chest pain, angina	☐ No ☐ Yes	
Any condition requiring heart surgery	☐ No ☐ Yes	
Abnormal shortness of breath or chest disease	☐ No ☐ Yes	
Palpitations / irregular heartbeat	☐ No ☐ Yes	
Anaemia	☐ No ☐ Yes	

Pilot name:

2. Do you suffer from or have you ever suffered from (continued):			Doctors comments
Head injury, spinal injury	No	Yes	
Seizures, fits, convulsions, epilepsy	No	Yes	
Blackouts or fainting	No	Yes	
Migraine	No	Yes	
Stroke	No	Yes	
Dizziness, vertigo, problems with balance	No	Yes	
Double vision, difficulty seeing, or difficulty adapting to changing light conditions	No	Yes	
Colour blindness	No	Yes	
Diabetes	No	Yes	
Neck, back or limb disorders	No	Yes	
Hearing loss or deafness or had an ear operation or use a hearing aid	No	Yes	
A psychiatric illness or nervous disorder	No	Yes	

3. Have you ever had any other serious injury, illness, operation, or been in hospital for any reason?	No	Yes	

4. Do you smoke or have you ever been a smoker?

No	
Ex-smoker	Quit date:
Yes	Number of cigarettes per day:

Doctors comments

5. Do you use illicit drugs? No Yes

Doctors comments

Pilot name:

6.	The following questions are about your sleeping patterns:		Doctors comments
6.1	Have you ever been told by a doctor that you have a sleep disorder, sleep apnoea or narcolepsy?	☐ No ☐ Yes	
6.2	Has anyone noticed that your breathing stops or is disrupted by episodes of choking during your sleep?	☐ No ☐ Yes	

Please use the following scale (Epworth Sleepiness Scale) to choose the most appropriate description for each situation. The questions refer to your usual way of life in recent times. Even if you haven't done some of these things recently try to work out how they would have affected you.

6.3 How likely are you to doze off or fall asleep (rather than just feeling tired) in the following situations:	would never doze off (0)	slight chance of dozing (1)	moderate chance of dozing (2)	high chance of dozing (3)
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 the traffic	☐	☐	☐	☐

Doctors comments

7. The following questions relate to your intake of alcohol. Please select the answer that is correct for you:		(0)	(1)	(2)	(3)	(4)
7.1	How often do you have a drink containing alcohol?	☐ Never (go to Q8)	☐ Monthly or less	☐ 2 to 4 times per month	☐ 2 to 3 times per week	☐ 4 or more times per week
7.2	How many drinks containing alcohol do you have on a typical day when you are drinking?	☐ 1 or 2	☐ 3 to 5	☐ 5 to 6	☐ 7 to 9	☐ 10 or more
7.3	How often do you have six or more drinks on one occasion?	☐ Never	☐ Monthly or less	☐ 2 to 4 times per month	☐ 2 to 3 times per week	☐ 4 or more times per week
7.4	How often during the last year have you found that you were not able to stop drinking once you had started?	☐ Never	☐ Monthly or less	☐ 2 to 4 times per month	☐ 2 to 3 times per week	☐ 4 or more times per week
7.5	How often during the last year have you failed to do what was normally expected from you because of drinking?	☐ Never	☐ Monthly or less	☐ 2 to 4 times per month	☐ 2 to 3 times per week	☐ 4 or more times per week
7.6	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	☐ Never	☐ Monthly or less	☐ 2 to 4 times per month	☐ 2 to 3 times per week	☐ 4 or more times per week

Pilot name:

7. The following questions relate to your intake of alcohol (continued).	(0)	(1)	(2)	(3)	(4)
7.7 How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Monthly or less	2 to 4 times per month	2 to 3 times per week	4 or more times per week
7.8 How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Monthly or less	2 to 4 times per month	2 to 3 times per week	4 or more times per week
7.9 Have you or someone else been injured as a result of your drinking?	No		Yes, but not in the last year		Yes, during the last year
7.10 Has a relative or friend, or a doctor or other health pilot been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year

Doctors comments

8. The following questions relate to how you are feeling.

In the past 4 weeks about how often did you:	None of the time (1)	A little of the time (2)	Some of the time (3)	Most of the time (4)	All of the time (5)
Feel tired out for no good reason?					
Feel nervous?					
Feel so nervous that nothing could calm you down?					
Feel hopeless?					
Feel restless or fidgety?					
Feel so restless you could not sit still?					
Feel depressed?					
Feel that everything was an effort?					
Feel so sad that nothing could cheer you up?					
Feel worthless?					

Doctors comments

Pilot name:

PART C – For existing employees only

			Doctors comments
9.	Have you experienced difficulty completing any tasks required for your piloting work (e.g. climbing pilots ladder, difficulty with decision-making, difficulty with interpersonal relationships)? If yes, please describe:	☐ No ☐ Yes	
10.	Have experienced persistent symptoms such as feeling tired, drained or exhausted? If yes, please describe:	☐ No ☐ Yes	
11.	Have you been involved in any accidents or near misses at work in the period since your last assessment? If yes, please describe:	☐ No ☐ Yes	
12.	Have you tested positive for drugs or alcohol (at work or elsewhere e.g. driving) in the period since your last assessment? If yes, please describe:	☐ No ☐ Yes	

PART D – Pilot's declaration

(To be completed by the pilot in the presence of the health professional after completing the questionnaire)

I, *(print name)*

certify that to the best of my knowledge the information provided by me is true and correct.

Signature of pilot:

Signature of doctor: Date:

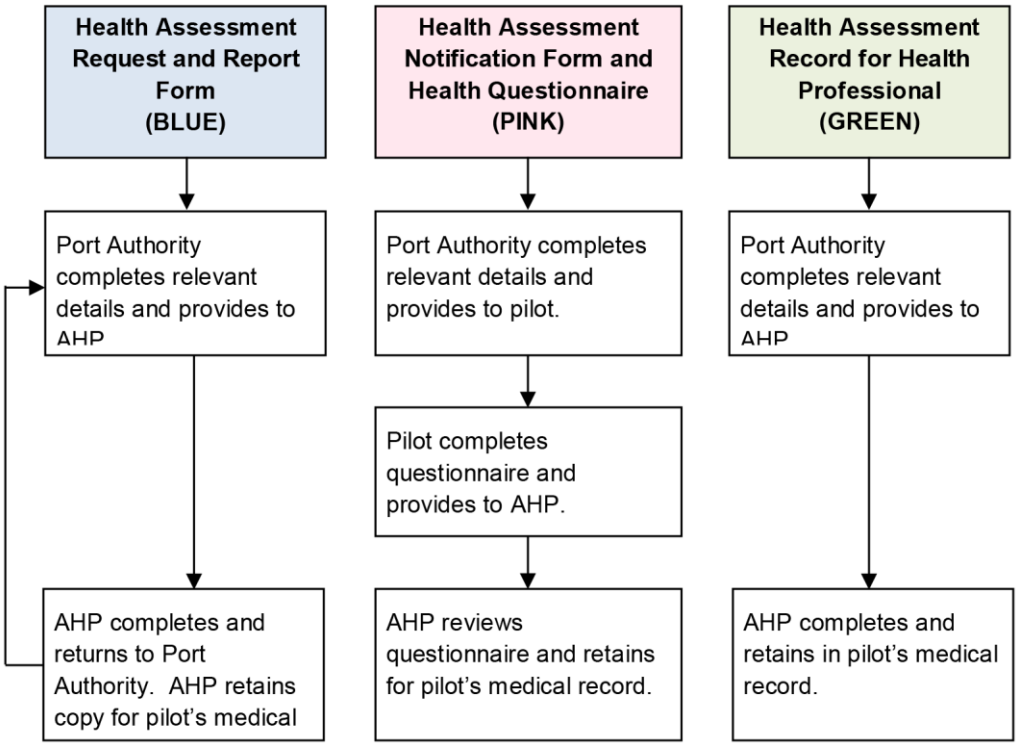
3 Record for Health Professional (Green Form)

The Health Assessment Record for Health Professionals is a tool that guides the health assessment process. It provides a standard format for recording the results of the assessment, which should then be filed by the Authorised Health Professional in the pilot's medical history.

The form should be used as follows:

1. **Part A:** The Port Authority completes PART A, and includes the form with the Request and Report Form (Blue Form) and forwards to the Authorised Health Professional.
2. **Part B:** The health professional records the results of the clinical examination in PART B and retains the form in the pilot's medical record.
3. The completed Health Assessment Record is not to be forwarded to the Port Authority for reasons of privacy. The Authorised Health Professional should summarise the results in terms of fitness for duty on the Request and Report Form (Blue Form).

Use of health assessment forms



Pilot name:

Name of Port Authority:

Marine Pilot Health Assessment
Record for Health Professional

GREEN FORM

CONFIDENTIAL:

FOR PRIVACY REASONS THE COMPLETED FORM SHOULD BE RETAINED BY THE AUTHORISED HEALTH PROFESSIONAL AND NOT RETURNED TO THE PORT AUTHORITY

Date of request:

1. Pilot / Applicant details

Family name: First names:

Employee no.: Date of birth:

2. Port Authority details

Port Authority:

Supervisor / contact:

Phone: Facsimile:

Email:

3. Health assessment appointment details

Doctor / practice:

Address: Phone:

Appointment date: Time:

PART B – Patient consent – Pilot to complete

(If required to consult with general practitioner or other treating doctor)

I, *(print name)* ☐ give ☐ do not give *(please indicate)* permission for the examining health professional to contact my treating doctor(s) to discuss or clarify information relating to my current health status.

Signature:

(1) Name of doctor: Phone:

(2) Name of doctor: Phone:

Pilot name:

PART C – Examination record – Authorised Health Professional to complete

1. Hearing

Medical comments

Including comments regarding management of existing hearing problems.

1.1 Hearing issues identified on Health Questionnaire? ☐ No ☐ Yes

1.2 Hearing aids worn? ☐ No ☐ Yes

1.3 Audiometry results (Date:)

	0.5 kHz	1.0 kHz	2.0 kHz	3.0 kHz
Right				
Left				

Acceptable Better than 40 dBA at 0.5, 1.0, 2.0 and 3.0 KHz (not averaged)

2. Vision

Medical comments

Including comments regarding management of existing vision problems.

2.1 Vision issues identified on Health Questionnaire? ☐ No ☐ Yes

2.2 Glasses worn? ☐ No ☐ Yes

2.2 Contact lenses worn? ☐ No ☐ Yes

2.3 Visual acuity test

Uncorrected		Corrected	
R	L	R	L
6 /	6 /	6 /	6 /

Acceptable Better eye 6/9 Worse eye 6/18

2.5 Visual fields *(Confrontation to each eye)* ☐ Normal ☐ Abnormal

2.6 Colour vision *(Ishihara ≥ 3 errors / 12 screening plates is a fail)* ☐ Pass ☐ Fail

3. Body Mass Index

Medical comments

Including comments regarding management of existing weight management issues.

3.1 Previous issues with weight management ☐ No ☐ Yes

3.2 Calculate BMI

Weight (kg) Height (m)

BMI *BMI = Weight (kg) / Height (m)²*

☐ BMI <30 Fit for Duty

☐ BMI >30 but < 35 Fit Subject to review

☐ BMI > 35

- ☐ Passes Ropes Test Fit Subject to Review
- ☐ Fails Ropes test Temporarily Unfit

Also consider in relation to Sleep Disorders Assessment (see Section 9)

Pilot name:

4.	Coordination / balance			Medical comments
4.1	Balance issue identified on Health Questionnaire?	No	Yes	
4.2	Romberg's test	Normal	Abnormal	

(A pass requires the ability to maintain balance while standing with shoes off, feet together side by side, eyes closed and arms by side, for thirty seconds)

5.	Musculoskeletal			Medical comments
5.1	Musculoskeletal issues identified on Health Questionnaire?	No	Yes	***Including comments regarding management of existing musculoskeletal conditions.***
5.2	Are there any injuries that preclude the tests below?	No	Yes	
5.3	Are there any scars, abnormalities or deformities of the neck, back or limbs?	No	Yes	
5.4	**NECK** – rotation, flexion and extension *(may be combined with thoraco-lumbar spinal movement)*			
	Able to rotate left to 90° (minimum of 45° cervical spine)	No	Yes	
	Able to rotate right to 90° (minimum of 45° cervical spine)	No	Yes	
	Able to extend	No	Yes	
	Able to flex	No	Yes	
5.5	**UPPER LIMBS** – shoulder, elbow, wrist and hands			
	Able to abduct arms above head	No	Yes	
	Able to push and pull with each arm	No	Yes	

Grip Strength test (Jamar):

- Set Jamar at ~30mm.
- Take 3 readings per hand alternating between hands
- Average readings for each hand.

	Reading 1	Reading 2	Reading 3	Average
Right				
Left				

Grip strength > 50th percentile — Pass

Grip strength < 50th percentile — Fail

Ropes Test (refer to Figure 24, page 122):

Calculate 40% of weight from 3.2 above _____ Kg

Maximum weight that can be held for 6 seconds _____ Kg

Ability to hold at least 60% body weight off scales for 6 seconds (40% remaining on scales)

Can hold > 60% of body weight for 6 sec — Pass

Can hold 40 – 59% of body weight for 6 sec — Pass

Can hold less than 40% body weight for 6 sec — Fail

Pilot name:

	Medical comments

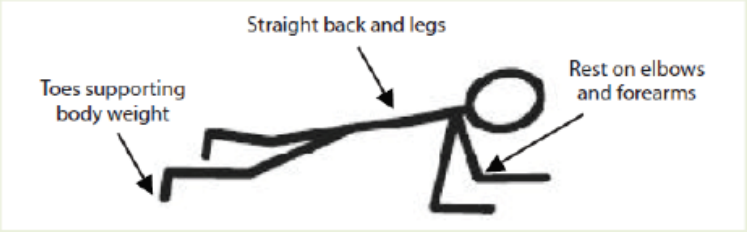
5.6 Back

Able to flex, extend and rotate the back ☐ No ☐ Yes

Bridge / hover test

☐ Hold hover for 60 seconds — Pass

☐ Cannot hold hover for 60 seconds — Fail



5.7 LOWER LIMBS – hips, knees and ankles

Examine	Normal	
• Gait	☐ No	☐ Yes
• Standing and walking on toes	☐ No	☐ Yes
• Standing and walking on heels	☐ No	☐ Yes
• Squatting down and rising	☐ No	☐ Yes
• Kneeling and rising	☐ No	☐ Yes
• Ability to complete a step test	☐ No	☐ Yes

5.8 SUMMARY: Is the applicant able to achieve all movements described in the musculoskeletal criteria? ☐ No ☐ Yes

6. Cardiovascular system	Medical comments

6.1 Cardiovascular issues identified in Health Questionnaire? ☐ No ☐ Yes

Including existing cardiovascular conditions.

6.2 Blood pressure		**Repeated (if necessary)**		**Acceptable***
Systolic		Systolic		< 170 mmHg
Diastolic		Diastolic		< 100 mmHg

6.3 Pulse rate ____ bpm ☐ Regular ☐ Irregular

6.4 Heart sounds ☐ Normal ☐ Abnormal

6.5 Peripheral pulses ☐ Normal ☐ Abnormal

Pilot name:

Medical comments

6.6 Calculation of Cardiac Risk Level (refer Cardiovascular chapter for scoring – Figure 14)

Risk data:		Data
Age / sex		
Smoker: Y / N		
Blood pressure (systolic)		
ECG (left ventricular hypertrophy)		
Fasting cholesterol	– TOTAL	
	– HDL	
Diabetic (HbA1c >7.0%)		
Absolute risk (%)		

See Figure 14 for management

Including other considerations e.g. physical activity, diet, symptoms, family history and past history, comorbidities, work conditions:

6.7 VO_2 max test

VO_2 max _____ ml / kg / min

☐ Above average

☐ Average / Below average

Medical comments

7. Chest / Lungs ☐ Normal ☐ Abnormal

8. Abdomen ☐ Normal ☐ Abnormal

9. Sleep – Epworth Sleepiness Scale

Medical comments

Including comments about existing sleep disorders:

9.1 Sleep issue or fatigue identified in Health Questionnaire? ☐ No ☐ Yes

9.2 ***ESS score (record results from Q6 of the Health Questionnaire)*** _____

☐ Score 0-10

- ☐ No other symptoms / risk factors / incidents — ☐ Fit for Duty
- ☐ Plus other symptoms / risk factors / incidents — ☐ Fit Subject to review
- ☐ Temporarily Unfit

☐ Score 11-15

- ☐ No other symptoms / risk factors / incidents — ☐ Fit for Duty
- ☐ Plus other symptoms / risk factors / incidents — ☐ Fit Subject to review
- ☐ Temporarily Unfit

☐ Score ≥ 16 — ☐ Temporarily Unfit

Pilot name:

10. Substance misuse		Medical comments
10.1 Substance misuse issue identified in Health Questionnaire?	☐ No ☐ Yes	*Including comments regarding management of existing substance misuse issues*
10.2 Positive drug screen since last assessment?	☐ No ☐ Yes	
10.3 AUDIT Score *(Record results from Q7 of the Health Questionnaire)*		
☐ Zone I (0-7)	☐ Fit for Duty	
☐ Zone II (8-15)	☐ Fit for Duty	
☐ Zone III (16-19) – Brief counselling	☐ Fit Subject to Review ☐ Temporarily unfit	
☐ Zone IV (20-40) – Diagnostic evaluation and treatment	☐ Temporarily unfit	

11. Psychological health		Medical comments
11.1 Psychological issue identified in Health Questionnaire?	☐ No ☐ Yes	*Including comments regarding management of existing psychiatric conditions*
11.2 K10 Questionnaire Score *(Record results from Q8 of the Health Questionnaire)*		
☐ Zone I (10-18)	☐ Fit for Duty	
☐ Zone II (19-24)	☐ Fit for Duty	
☐ Zone III (25-29) – Refer to GP and/or counselling	☐ Fit Subject to Review ☐ Temporarily unfit	
☐ Zone IV (35-50) – Refer for assessment	☐ Temporarily unfit	
11.3 Is attitude, speech and behaviour appropriate regarding cognition and inter-personal skills?	☐ No ☐ Yes	

12. Medication	Medical comments
Record details of medications from the Health Questionnaire	

Pilot name:

PART D – Relevant clinical findings and action

Note comments on any relevant findings detected in the questionnaire or examination, making reference to the requirements of the Standard.

				Comments
1.	Were there any significant findings? If yes, please describe.	☐ No	☐ Yes	
2.	Were the criteria for the standard met? If not, please describe.	☐ No	☐ Yes	
3.	Are any further investigations / referral required? If yes, please describe.	☐ No	☐ Yes	

4. How has the pilot been categorised: — **Comments**

- ☐ Fit for Duty
- ☐ Fit for Duty Subject to Review (describe the reasons and nominate date for review)
- ☐ Fit for Duty Subject to Job Modification (describe suggested alternative duties. Identify timeframes for application of modifications)
- ☐ Temporarily Unfit for Duty Subject to Review (describe reasons, contact the Port Authority immediately)
- ☐ Permanently Unfit for Duty (describe the reasons)

5. Consent — **Comments**

Was the pilot's GP contacted (with their consent) ☐ No ☐ Yes

If yes, please provide brief notes regarding discussion with the GP.

6. Other clinical notes

Name of Doctor:

Signature of doctor: Date:

APPENDIX 2. PROCEDURES FOR THE APPOINTMENT AND MANAGEMENT OF AUTHORISED HEALTH PROFESSIONALS

1 Purpose

These procedures outline the process for appointing and managing Authorised Health Professionals to conduct health assessments in accordance with the Standard for Health Assessment of Marine Pilots (NSW). They relate to the initial appointment of Authorised Health Professionals and to the requirements for maintaining their authorisation. The procedures have been agreed by Transport for NSW in consultation with the Port Authority of New South Wales. They align with the requirements laid out in the Standard as well as those in the *Guidelines on the Medical Examinations of Seafarers, ILO/IMO/JMS/2011/12.*

2 Criteria for authorisation

Health assessments for marine pilots can only be conducted by Authorised Health Professionals who meet the criteria outlined in the Standard for Health Assessment of Marine Pilots (NSW) and shown in Table 1. Once appointed, Authorised Health Professionals must maintain their knowledge and skills and participate in quality control activities as outlined in Table 2.

Authorisation applies to an individual health professional, not a practice or organisation. All Authorised Health Professionals conducting health assessments for marine pilots under the Standard must be individually authorised by Transport for NSW.

3 Procedure for Appointment

3.1 Making an application

A medical practitioner may make an application in writing to Transport for NSW for appointment as an Authorised Health Professional. The applicant will need to provide evidence of meeting the criteria specified in Table 1. On receiving the application, if the criteria have been met, Transport for NSW will authorise the health professional to conduct health assessments and publish the name on the Transport for NSW website.

3.2 Evidence of meeting criteria

Qualifications and experience

Evidence might include a CV showing:

- post graduate qualifications in occupational medicine such as via the Royal Australasian College of Physicians; or
- employment in a dedicated occupational health practice; or
- evidence that a substantial part of their practice is related to occupational health

Marine industry knowledge

Prospective Authorised Health Professionals can achieve a working knowledge of the marine pilotage environment by being trained and mentored by an experienced Authorised Health Professional. The mentoring Authorised Health Professionals may support the application by providing evidence of the education process and their outcomes to Transport for NSW. This may include evidence of face to face meetings, telephonic/video conferences and supervised health assessments.

There are a number of resources available to support prospective Authorised Health Professionals in attaining the required knowledge to support their application:

- The Standard has a detailed explanation about inherent requirement of the marine pilot job including photographs of key tasks.
- Pilotage videos are available on the Transport for NSW website showing the general requirements of the pilotage tasks as well as embarkation and disembarkation using a pilot ladder.
- 'Youtube' videos are also available showing the general requirements of the pilotage tasks as well as embarkation and disembarkation of pilot using pilot ladder or helicopter.
- There are also many other online resources that can be used to educate regarding with the marine pilot's job.

To have a better understanding of the inherent requirements of pilot's job, it is strongly recommended that prospective Authorised Health Professionals:

- visit the pilot ladder simulator available at Port Botany and Newcastle;
- go out with a pilot on a pilot vessel to observe the embarkation and disembarkation of a pilot from a vessel using a pilot ladder; and
- visit the bridge of a vessel while the vessel is berthed alongside or while under pilotage.

The Standard

Prospective Authorised Health Professionals must familiarise themselves with the requirements of the Standard, including the inherent requirements of pilotage, the health assessment and administrative procedures, the classifications of fitness, the medical criteria and use of the forms. The Authorised Health Professionals can clarify any queries on these matters with peers, other Authorised Health Professionals, or Transport for NSW.

Maintaining currency

Once authorised, Authorised Health Professionals must maintain the currency of their knowledge of the Standard as described above and in accordance with Table 2.

List of Authorised Health Professionals

Transport for NSW will promulgate a list of currently Authorised Health Professionals on its website.

Table 1.	Criteria for appointing Authorised Health Professionals to conduct health assessments under the Standard for Health Assessment of Marine Pilots (NSW)

Qualifications and experience:

The health professional must be a registered medical practitioner and should have qualifications or experience in occupational medicine.

Marine industry knowledge:

The health professional should demonstrate a working knowledge of the marine pilotage environment including the work performed and risks involved.

The Standard:

The health professional must demonstrate familiarity with the *Standard for Health Assessment of Marine Pilots NSW*, including:

- an appreciation of the role of health assessments in ensuring marine safety;
- specific knowledge of the inherent requirements of the marine pilot's job and the rationale for the health assessments applied;
- a knowledge of and the ability to perform the Marine Pilot Health Assessment;
- an understanding of the requirements and reporting options available for assessing fitness for duty;
- a knowledge of the administrative requirements of health assessments, including form completion and record keeping;
- an understanding of ethical and legal obligations and the ability to conduct health assessments accordingly, including the necessity of appropriate communication with the pilot and the Port Authority; and
- an understanding of ethical issues involved in relationships with the treating doctor/general practitioner.

Interfacing policies and programs.

The health professional should be able to demonstrate an awareness of legislation, policies or programs that might interface with or impact upon the health assessment, for example, drug and alcohol policies, critical incident management programs, anti-discrimination legislation and privacy legislation.

Table 2. Ongoing requirements for Authorised Health Professionals
Maintaining currency: The health professional must discuss annually with the Pilotage Manager of any port within the Port Authority of New South Wales to the latest operational procedures for marine pilots and changes in policies if any. The discussion could be face to face meeting, telephonic conversation or through email exchange. An email recording that this discussion has taken place must be sent to the appropriate manager in Transport for NSW. The health professional can maintain currency by conducting regular health assessments of marine pilots or by following procedure under 'Evidence of meeting criteria for marine industry knowledge'. Health professionals must maintain a record of evidence that demonstrates their currency. This will be assessed during audits. The health professionals must maintain professional standards in accordance with their professional body's requirements.
Participating in audits: Health professionals must consent to participate in safety management and quality assurance audits when requested to do so by Transport for NSW.