CS Health

DRAFT

NSW Coal Industry
Sleep Health Standard

NSW Coal Industry Sleep Health Standard

Published by Coal Services Pty Limited
Level 21, 44 Market Street, Sydney NSW 2000

Published {insert date}

www.coalservices.com.au

Foreword

The New South Wales (NSW) health surveillance scheme for coal mine workers plays a crucial role in safeguarding the health and safety of individuals working in the industry. It identifies occupational, environmental, and other health issues that may affect a coal mine worker's ability to perform their duties safely and effectively.

The NSW Coal Industry Sleep Health Standard is the third in a series of health standards developed specifically for the NSW coal industry. These standards are designed to ensure coal mine workers with identified health conditions receive the necessary monitoring and support to maintain their health. Additionally, the health standards outline the roles and responsibilities of coal mine workers, employers and clinicians in maintaining a system for protecting occupational and environmental health.

Drawing on best practice, the NSW Coal Industry Sleep Health Standard provides guidance to approved medical practitioners, helping them make consistent, evidence-based clinical decisions relating to sleep health. This Standard specifies the investigations and follow-up actions required when assessing a coal mine worker's sleep health.

We extend our gratitude to the Coal Services Standing Health Committee and {insert SMEs who contributed} for their efforts in developing this Standard, in collaboration with industry stakeholders, and relevant medical specialists.

Dr Peter Yu
Chair
Coal Services Clinical Governance Committee

Angela Hunter
Managing Director/CEO
Coal Services

Contents

Abbreviations and acronyms

AHI	Apnoea hypopnoea index
AHPRA	Australian Health Practitioner Regulation Agency
AMP	Approved medical practitioner
BMI	Body mass index
CS Health	Coal Services Health
CPAP	Continuous positive airway pressure
ESS	Epworth sleepiness scale
GP	General practitioner
MSLT	Multiple sleep latency test
MWT	Maintenance of wakefulness test
OSA	Obstructive sleep apnoea
OSAS	Obstructive sleep apnoea syndrome
PCBU	Person conducting a business or undertaking

Glossary

Term	Definition
Apnoea	A complete cessation of breathing that lasts 10 seconds or greater.
Apnoea hypopnoea index (AHI)	A metric that measures the total number of apnoeas (complete breathing pauses) and hypopnoeas (partial breathing reductions) per hour of sleep which is determined during an overnight sleep study. The AHI score is used to quantify the severity of obstructive sleep apnoea (OSA).
Approved medical practitioner (AMP)	A medical practitioner who is registered by the AHPRA to practice medicine in Australia, complies with the Clinical and Service Standard, and is approved by Coal Services.
Australian Health Practitioner Regulation Agency (AHPRA)	Australia's national regulator of registered health professionals. AHPRA works in partnership with the National Boards to ensure that Australia's registered health practitioners are suitably trained, qualified and safe to practise.
Body Mass Index (BMI)	An internationally recognised standard to classify the body weight of adults. It is used as a general indicator of whether someone is underweight, normal weight, overweight or obese. It is calculated by dividing the weight in kilograms by the height in metres squared.
Cataplexy	A sudden, temporary loss of muscle control, which can vary in affect from mild weakness to complete collapse, whilst the person remains conscious throughout the episode. It is a symptom of some types of narcolepsy.
Clinical and Services Standard	The Clinical and Service Standard developed and approved by Coal Services, as amended from time to time or replaced. The Clinical and Service Standard outlines the training and requirements for approved health professionals and approved medical practitioners to conduct health assessments, health assessment reviews, and retirement health assessments.
Coal mine worker	A person who carries out work at a coal mine or a coal handling preparation plant for a person conducting a business or undertaking. It does not include a person who works in an environment in which they are not exposed to airborne contaminant, hazardous chemicals, and/or occupational noise unless the person has previously worked in an area of a coal mine or coal handling preparation plant in which they were exposed to airborne contaminant, hazardous chemicals, and/or occupational noise.
Continuous positive airway pressure (CPAP)	A common, non-invasive treatment for obstructive sleep apnoea (OSA) and other breathing disorders. It involves using a CPAP machine to deliver a constant stream of air through a mask, keeping the airway open during sleep to prevent airway obstruction and improve breathing and sleep quality.

Term	Definition
Duty of care referral	A referral made by the approved medical practitioner at the conclusion of a health assessment, health assessment review or retirement health assessment, intended to support the personal health and wellbeing of the coal mine worker. The coal mine worker is not required to report the outcome of this referral to the approved medical practitioner.
Epworth Sleepiness Scale (ESS) questionnaire	A self-administered questionnaire that measures subjective daytime sleepiness by rating the likelihood of dozing off in various situations. It is used to help with screening for excessive daytime sleepiness.
Excessive worktime sleepiness	The persistent and undesirable difficulty staying awake and alert, or an increased, often overwhelming, desire to sleep during working hours, even when sedentary.
Fitness for work	Fitness for work means that a person (coal mine worker) is in a physical and psychological state that enables them to perform their work tasks competently and in a manner which does not affect their health, safety or wellbeing, or that of others. A coal mine worker who is deemed fit for work is in a physical and psychological condition to meet their health, safety and work obligations competently.
Fitness for work assessment	A fitness for work assessment is an assessment of the coal mine worker's physical, psychological, and/or functional capacity to perform their position, taking into account any foreseeable risk to the health and/or safety arising from the coal mine worker's condition.
General Practitioner (GP)	A medical doctor who holds specialist registration with AHPRA as a General Practitioner and provides primary healthcare services, diagnosing and treating a wide range of conditions. GPs offer preventive care, manage chronic illnesses, and refer patients to other specialists when needed. They are often the first point of contact for medical concerns and play a key role in patient care.
Health assessment	Refers to the health examinations of a coal mine worker or prospective coal mine worker that meets the following criteria: has been completed within the previous three (3) years; is assessed against the position and risk category; is completed by an approved medical practitioner; is in the form approved by and provided to Coal Services; and is approved by Coal Services. The reference to three (3) years means by 31 December of that calendar year.
Health assessment certificate	A certificate issued by an approved medical practitioner after the completion of a health assessment, health assessment review, or retirement health assessment, and must contain the information in response to items 1 to 13 in Schedule 2 and is provided to the person conducting a business or undertaking who requested the health assessment, health assessment review, or retirement health assessment; and is in the form approved by and provided to Coal Services: and is approved by Coal Services.
Health assessment review	A review of a health condition(s) identified in a health assessment or a health assessment review of a coal mine worker as a one off or at defined intervals, or a health examination(s) including a deferred health examination(s) that meets the following criteria: is assessed against the position and risk category; is completed by an approved medical practitioner; is in the form approved by and provided to Coal Services; and is approved by Coal Services.

Term	Definition
Health certification	A health determination with limited medical information to support the person conducting a business or undertaking to create a safe system of work, and is documented on a health assessment certificate by an approved medical practitioner following the completion of health examinations as outlined in Schedule 1, and any health assessment reviews which assesses the ability of a coal mine worker or prospective coal mine worker to perform the position and risk category as outlined in clause 6 (b) (iii) and (iv).
Hypertension	Hypertension is when the pressure in the blood vessels is too high. It is defined as a systolic blood pressure ≥ 140 mmHg and/or a diastolic blood pressure ≥90mmHg. Within this Standard the presence of hypertension is part of the STOP-Bang questionnaire, used to screen for the presence of obstructive sleep apnoea.
Hypopnoea	An abnormally shallow or slow breathing event which occurs during sleep and lasts for at least 10 seconds. This causes a reduction in airflow and blood-oxygen levels, leading to disruptions to sleep.
Maintenance of Wakefulness Test (MWT)	A test that measures a person's ability to stay awake in a quiet, dark, and non-stimulating room. It can be used to assess the response to treatment for excessive daytime sleepiness.
Multiple sleep latency test (MSLT)	A test that measures how quickly a person falls asleep during the day. It is used to diagnose narcolepsy and other conditions that cause excessive daytime sleepiness.
Narcolepsy	A chronic, incurable neurological disorder that impairs the brain's ability to regulate the sleep-wake cycle and is characterised by excessive daytime sleepiness and tendency to fall asleep suddenly and uncontrollably. Other symptoms can include cataplexy, sleep paralysis, hallucinations, and disturbed night-time sleep.
Obesity hypoventilation syndrome	Is defined as a combination of obesity (body mass index ≥30 $kg \cdot m^{-2}$), daytime hypercapnia (raised carbon dioxide levels in the blood) and sleep disordered breathing, after ruling out other disorders that may cause alveolar hypoventilation.
Obstructive sleep apnoea (OSA)	A sleep disorder characterised by repeated interruptions to breathing during sleep. The interruptions, known as apnoeas, occur when the throat muscles relax excessively, leading to a blockage of the airway which reduces or temporarily stops breathing, leading to disruptions to sleep.
Obstructive sleep apnoea syndrome (OSAS)	A syndrome defined by the Australia Sleep Association by the following criteria: A. An overnight sleep study demonstrates 5 or more breathing events per hour of sleep (AHI ≥ 5). These events may include any combination of apnoea or hypopnea events. AND B. Symptoms that are not better explained by other conditions, either: • Excessive daytime sleepiness (Epworth Sleepiness Score ≥11/24), or • Two or more of the following: – unrefreshing sleep – persistent daytime fatigue or low energy – neurocognitive impairments, for example, near misses, inattention, reduced concentration, reduced memory, slow learning – mood disturbance, for example, irritability, dysphoria (very unhappy, uneasy, dissatisfied), anxiety.

Term	Definition
Occupational and environmental physician (OEP)	A medical practitioner who AHPRA publicly registers as a specialist in occupational and environmental medicine.
Order 45	Refers to the Coal Services Health Monitoring Requirements for Coal mine workers order no. 45 under the Coal Industry Act 2001 (NSW).
Person conducting a business or undertaking (PCBU)	Person conducting a business or undertaking has the same meaning given to that term under section 5 of the Work Health and Safety Act 2011 (NSW) (as amended from time to time or replaced).
Prospective coal mine worker	A person who is seeking to commence work for the first time at a New South Wales coal mine or coal handling preparation plant for a person conducting a business or undertaking. It does not include a person who will work in an environment in which they are not exposed to airborne contaminant, hazardous chemicals, and/or occupational noise.
Remote work	Has the same meaning as defined in NSW Work Health and Safety Regulation 2025 s 48. In relation to a worker, it means a worker that is isolated from the assistance of other persons because of location, time or the nature of the work.
Routine review	This refers to the Order 45 health assessment surveillance interval, which is three (3) yearly.
Similar exposure group (SEG)	A group of coal mine workers who have the similar general exposure to hazards, and can include similarity and frequency of tasks performed, types of materials and processes used, and similarities in the way a task(s) is performed, as listed on the Coal Services website (as amended from time to time or replaced).
Sleep Disorder	The collective term sleep disorder refers to conditions that affect sleep quality, timing, or duration and impact a person's ability to properly function while they are awake. These disorders can contribute to other medical problems, and some may also be symptoms for underlying mental health issues.
Sleep Physician	A medical doctor who specialises in diagnosing and treating sleep disorders. They have been qualified by the Royal Australasian College of Physicians (RACP) as a sleep physician, and are currently registered as such by the Australian Health Practitioner Regulation Agency (AHPRA).
Sleep study	A range of tests used to diagnose sleep disorders and monitor sleep patterns. It is performed overnight while the individual sleeps and, depending on the level of information required, monitors breathing, oxygen levels, brain activity, heart rate, eye and leg movements.
Sleep study type 1 (in-laboratory polysomnography)	A type 1 sleep study, also known as a polysomnography study, is a comprehensive in-laboratory sleep test performed overnight in a sleep clinic or hospital setting under the supervision of trained staff. It records a minimum of 7 channels including brain activity, eye movement, muscle activity, heart rhythm, airflow, breathing effort and oxygen saturation. It is considered the gold standard for diagnosing sleep disorders.
Sleep study type 2 (portable polysomnography)	A comprehensive, at home sleep test used to diagnose sleep disorders, recording a minimum of 7 channels including brain activity, eye movement, muscle activity, heart rhythm, airflow, breathing effort and oxygen saturation. It has similar components to a type 1 study however is performed unsupervised, via a portable polysomnography device, overnight in the individual's home.

Term	Definition
Sleep study type 3	A home-based sleep test that can detect the presence of breathing related sleep disorders such as obstructive sleep apnoea. It monitors a minimum of 4 channels, including breathing, oxygen levels and heart rate. However, it doesn't monitor brain activity, muscle movement or eye movement and cannot determine an AHI so is less comprehensive and accurate than a type 1 or 2 sleep study.
Sleep study type 4	An at-home non-diagnostic, screening test for obstructive sleep apnoea. It only monitors 1 or 2 measured parameters such as oxygen saturation, heart rate or airflow, which assist in determining if an individual has a higher risk of having OSA and may need a more comprehensive sleep study.
STOP-Bang questionnaire	An eight-question screening tool used to determine the risk of obstructive sleep apnoea. It asks about **S**noring, **T**iredness, **O**bserved apnoeas, **P**ressure (high blood pressure) as well as **B**ody-mass index, **A**ge, **N**eck circumference and **G**ender. The number of yes responses is given a score which correlates with the risk of obstructive sleep apnoea, which guides the need for further investigation.
This Standard	Refers to the NSW Coal Industry Sleep Health Standard.
Treatment resistant hypertension	Blood pressure requiring at least 3 medications to control. This includes multi-combination antihypertensive preparations.

Introduction

Coal Services

Coal Services is a Specialised Health and Safety Scheme proudly protecting the NSW coal industry and its workers for over 100 years.

We offer a comprehensive range of critical services designed to minimise workplace injuries and illnesses. In collaboration with our industry stakeholders, we are committed to safeguarding the health, safety and wellbeing of workers within the sector by focusing on prevention, early detection, enforcement, and educational initiatives.

Our purpose, vision and values are aligned to focus on the continued safety and health of our industry and its workers.

Our purpose: To protect

Our vision: To be a valued industry partner promoting a healthy workforce and safe workplaces.

Our values: We care. We work together. We make a difference.

Role of Coal Services

Coal Services' preventative and responsive services in the areas of workplace health and safety, workers' compensation, emergency response and training help to deliver on our purpose, 'to protect'.

Coal Services obtains all sources of power for the company's operations from the provisions set out in the company's approval under Section 9 of the *Coal Industry Act 2001* (NSW) (the Act). We exercise these functions in accordance with Section 10(1) of the Act.

Our statutory responsibilities are defined in the Act and while we are responsible for ensuring these and the various Orders pertaining to it are maintained and enforced.

Coal Services' unique collaborative model is like no other in the world. With our purpose, 'to protect' at its centre and enabled by collaboration with all industry stakeholders, the model demonstrates our role in supporting industry to comply with the strong legislative and regulatory framework that exists in NSW, as well as keeping coal mine workers' health, safety and wellbeing at the forefront of decision making.

The collaborative model and the services provided by our Specialised Health and Safety Scheme have delivered proven results in safeguarding against injury and occupational disease.

Health surveillance scheme for NSW coal mine workers

Under the Act, CS Health is responsible for executing health Orders to monitor the health of NSW coal mine workers for any health effects due to occupational exposures to dust, noise, chemicals, and other workplace hazards.

The health assessments detailed in the Order can also identify other health and lifestyle-related conditions that may impact a coal mine worker's ability to work safely and effectively. This includes screening for the presence of sleep disorders, including obstructive sleep apnoea.

Regular screening provides an opportunity to identify occupational and non-occupational diseases early, often before symptoms manifest. This provides greater scope for effective treatments and preventative measures to keep coal mine workers safe.

The health surveillance scheme also helps NSW coal industry employers to fulfil their health and safety obligations to protect the health and wellbeing of their workforce.

CS Health provides dedicated support to industry and approved medical practitioners for Order 45 compliance through various channels.

Scope

This Standard applies to all approved medical practitioners (AMPs) who complete Order 45 health assessments on NSW coal mine workers or prospective coal mine workers. The AMP must comply with all guidelines, policies, and standards issued or endorsed by Coal Services. This Standard is designed to provide guidance to AMPs on the health certification for identified sleep conditions or abnormalities.

This Standard can also be used as a resource for coal mine workers and any person conducting a business or undertaking (PCBU) to understand the management of sleep conditions in the NSW coal industry.

It does not include information on the medical management of identified sleep conditions outside the coal mining environment.

Background

NSW Coal Industry Health Standards

The NSW Coal Industry Health Standards stipulate the framework that Coal Services requires approved medical practitioners to operationalise and ensure the consistent, uniform delivery of quality Order 45 health assessments.

AMPs are required to assess a coal mine worker's fitness for work.

Coal mine workers work across diverse environmental conditions, with potentially unpredictable workloads, and are exposed to many occupational hazards that are unique to the coal industry. Depending on the role performed and/or the work environments, if the worker suddenly loses capacity they could potentially harm not only themselves, but also others. The consequences of this could vary from minor impact to multiple fatalities, and/or major asset damage.

Order 45 health assessments and the criteria used for assessing fitness for work in a coal mine must consider both the coal mine worker's position and the hazards to which they may be exposed.

What are NSW Coal Industry Health Standards?

The NSW Coal Industry Health Standards:

- Are practical, risk-based assessment tools designed to facilitate an AMP's evaluation of a coal mine workers fitness for work for a specific position.
- Define Coal Services' enterprise tolerance to operational health-related risks, such as the level of medical fitness required for specific positions by considering a position's physical and psychological demands, as well as the foreseeable risks to health and/or safety that correlate with a worker's position tasks and work environment.
- Help to identify health issues that can foreseeably limit capacity, impair job performance and/or pose a foreseeable risk to health and/or safety in the workplace, leading to incidents, injuries or illness.
- Cover the aspects of health that are clinically relevant to safety-critical work, including physical and psychological fitness and specific functions like vision, hearing and cardiovascular health.
- Include health assessment review requirements and medical management plans that are based on internationally recognised medical best practices.

The benefits of NSW Coal Industry Health Standards

NSW Coal Industry Health Standards:

- Assist AMPs to identify job accommodations or adjustments required to ensure coal mine workers can carry out their work safely and effectively.
- Provide a practical approach via a process of risk stratification. This ensures that positions with similar tasks and perceived risks are grouped, so coal mine workers in similar risk roles undergo consistent and appropriate medical evaluations.
- Maximise consistency, transparency, and fairness in Order 45 health certification.
- Reduce ambiguity.
- Provide a clear health certification criteria.
- Reduce the need for escalation of routine matters.

Evidence base

The medical guidance and health certification criteria outlined in this Standard are based on published evidence and best practice standards regarding the monitoring of sleep health and the impact of sleep disorders on fitness for work.

Where evidence specific to the coal mining environment is limited, this Standard incorporates relevant research from other safety-critical industries, including the Australian Road and Australian Rail sectors.

This Standard references the *National Standard for the Health Assessment of Rail Safety Workers* (2024) and adapts key elements - including guidance for fitness for work determinations and follow up requirements – where applicable, to suit the specific demands of the coal industry.

The Australian National Driver Medical Standards *Assessing Fitness to Drive* (2022) guides the management of private and commercial drivers with health conditions and can be applied more broadly towards assessing fitness for work. Where relevant, they have been incorporated into this Standard.

The *Monash University Accident Research Centre Reports* (Charlton et al 2021) referenced in this Standard demonstrate the impact of sleep disorders on motor vehicle crash risk and driving performance. These findings have direct relevance to coal mine worker positions and health certifications.

This Standard also considers the Safe Work Australia *Guide for Managing the Risk of Fatigue at Work* Code of Practice (2025) when defining fatigue, its impact on workplace health and safety and the identification and management of fatigue risks within the NSW Coal Industry.

Evidence from relevant health bodies and professional organisations was reviewed to inform the development of this Standard. Where published evidence was limited, additional guidance was taken from subject matter experts, including sleep physicians and occupational physicians.

Risk Category Guidelines

General

In the coal industry, coal mine workers are assigned positions that include a variety of tasks with different levels of risk. These tasks can range from office-based administrative duties to operating equipment in open cut, underground, and industrial environments, often in dynamic workplace conditions.

Coal mine workers must have the physical and psychological capability to safely perform the tasks associated with their position and be able to effectively respond to workplace risks and changes through sound perception and judgment.

Various medical conditions, disabilities, or treatments may impact a coal mine worker's ability to safely undertake their work tasks. A coal mine worker's actions or inactions resulting from such a condition, could potentially lead to a serious incident, impacting themselves and/or others in the workplace.

Under the *Work Health and Safety Act 2011* (NSW), a PCBU has a primary duty of care to ensure, so far as reasonably practicable, the health and safety of workers and other persons at the workplace are not put at risk from work carried out as part of the conduct of the business or undertaking. Further, a PCBU must, as far as is reasonably practicable, ensure that a workers' health is monitored to prevent illness or injury arising from the work environment.

In addition, all workers have a duty to take reasonable care to ensure that their actions or omissions do not negatively impact the health and safety of others in the workplace.

These risks are assessed by the PCBU based on their knowledge of the coal mine workers' position, tasks, and available controls. This information permits AMPs to assess medical conditions to an appropriate level and recommend suitable follow-up review(s).

Coal Services has developed Risk Category Guidelines to assist PCBUs in assessing the risk category

of coal mine workers. These guidelines outline a structured approach for determining the risk category based on the coal mine worker's tasks and the potential risk to themselves and/or others in the event of an unavoidable and/or sudden incapacity.

Risk category

A risk category means the category of risk determined by the PCBU of a coal mine worker's or prospective coal mine worker's position as one of the following:

- Category A: Safety critical
- Category B: Safety sensitive
- Category C: Non-safety sensitive.

Table 1: Coal mine worker's risk categories

Risk category	Definition
Category A: Safety critical	A coal mine worker or prospective coal mine worker whose immediate action or inaction from an unavoidable and/or sudden medical incapacity may lead directly to a serious incident affecting others in the workplace.
Category B: Safety sensitive	A coal mine worker or prospective coal mine worker whose immediate action or inaction from an unavoidable and/or sudden medical incapacity may lead directly to a serious incident affecting themselves and is not likely to affect others in the workplace.
Category C: Non-safety sensitive	A coal mine worker or prospective coal mine worker whose immediate action or inaction from an unavoidable and/or sudden medical incapacity will not lead to a serious incident affecting others in the workplace and their work environment will not contribute adversely to the outcome.

Sleep Health Standard

Purpose of Sleep Health Standard

The NSW Coal Industry Sleep Health Standard has several purposes:

- to identify and assess whether a coal mine worker has adequate sleep health to undertake their position and risk category within a NSW coal mine
- to proactively identify coal mine workers who are at increased risk of a sleep disorder
- to ensure that coal mine workers with a known sleep disorder are appropriately identified, monitored and managed to minimise any potential health and safety risks to themselves and/or others while working at a NSW coal mine
- to enable a process for coal mine workers who have a sleep disorder to safely return to work and receive appropriate monitoring and management
- to help prevent comorbidities associated with sleep disorders and/or poor sleep hygiene

Sleep Disorders

Screening and risk factors for sleep disorders

Order 45 health assessments monitor and screen for the presence of sleep disorders which can pose significant health and safety risks for coal mine workers. This includes identification of risk factors for sleep disorders, including obstructive sleep apnoea, which is more prevalent in males, >50 years of age and those with obesity (particularly BMI ≥35kg/m2), diabetes and hypertension.

CS Health coal mine worker health data (1 July 2022 to 30 June 2025) shows:

- 91% of NSW coal mine workers are male
- 26% are ≥ 50 years of age (25.2% males, 32.5% females)
- 47.5% are obese with BMI ≥30kg/m2
  - 15.9% have a BMI ≥35kg/m2 (16% males, 15.7% females)
  - 3.9% have a BMI ≥ 40kg/m2 (3.8% males, 5% females)
- 19.2% have hypertension (20.5% males, 6.6% females)
- 3.8% have diabetes (3.6% males, 4.9% females)

Prevalence of sleep disorders

Sleep disorders are common and underdiagnosed.

An Australian study (McArdle et al 2023) of middle-aged adults aged 45 to 65, found a prevalence of clinically significant OSA in 24 per cent of females and 47 per cent of males. At least one sleep disorder was present in 43 per cent of the 895 people studied.

Some studies have suggested a higher prevalence of OSA and OSAS in transport vehicle drivers associated with risk factors such as obesity, age, and male gender. This is relevant for the NSW coal industry population considering 91 per cent of coal mine workers are male, 47.5 per cent are obese, and 26 per cent aged 50 years of age and above.

Potential symptoms of sleep disorders that may impact health and safety risk

Sleep disorders can impact alertness, cognitive function and physical health.

Coal mine workers with sleep disorders may experience decreased concentration, judgement and reaction times, increasing the risk of errors, accidents, injuries and potential hazards for themselves

and/others in the coal mine.

A number of sleep disorders can cause excessive worktime sleepiness, which may manifest as an increased tendency to doze at inappropriate times when required to stay awake, which has direct implications for safety critical and safety sensitive work.

Sleep disorders may also impair executive function, attention, and memory, further impacting workplace safety. These effects are particularly relevant to both Category A and Category B coal mine workers.

The potential symptoms impacting coal mine worker health and safety relating to various types of sleep disorders are summarised in Table 1 below.

Table 1: Sleep disorders and potential symptoms impacting health and safety risk

Sleep disorder category	Types and examples	Potential symptoms impacting work health and safety
Sleep-related breathing disorders	Sleep apnoeas and hypopnoeas including: • obstructive sleep apnoea (OSA) • obstructive sleep apnoea syndrome (OSAS) • central sleep apnoea and nocturnal hypoventilation • obesity hypoventilation	Excessive worktime sleepiness, fatigue, reduced alertness, delayed reaction times, mood changes, concentration and memory difficulties.
Insomnia	Short-term/acute insomnia Chronic insomnia	Excessive worktime sleepiness, fatigue, difficulty concentrating, slower reaction times, mood changes
Hypersomnolence disorders	Narcolepsy Idiopathic hypersomnia	Excessive worktime sleepiness, sudden sleep onset, cataplexy (sudden loss of muscle control), difficulty concentrating, memory issues
Circadian rhythm sleep-wake disorders	Those related to shift work, jetlag, delayed sleep-wake phase disorders	Excessive worktime sleepiness, fatigue, difficulty concentrating, decreased co-ordination and memory issues
Sleep-related movement disorders and parasomnias	Restless legs syndrome Sleepwalking	Excessive worktime sleepiness, delayed reaction time, decreased co-ordination and concentration.
Other disorders	Sleep-related gastroesophageal reflux, sleep-related myocardial ischaemia.	Excessive worktime sleepiness, fatigue, decreased alertness and concentration.

Impact of sleep disorders on health, safety and fitness for work

OSA is frequently associated with comorbidities including type 2 diabetes, thyroid disorders, cardiovascular, renal, respiratory, and psychological conditions. OSA is an independent risk factor for many of these comorbidities, and there is also evidence that some of these comorbidities may predispose to the development of OSA. Monitoring and management of comorbidities is an important consideration for the coal mine worker's fitness for work, health and wellbeing.

The latest Monash University accident research centre report (Charlton et al 2021) found that those

with sleep apnoea have an increased rate of motor vehicle accidents between 2 and 7 times that compared to control subjects as well as increased objectively measured sleepiness while driving. Studies have also demonstrated impaired driving simulator performance is people with confirmed sleep apnoea. This performance impairment is similar to that seen due to illegal alcohol impairment or sleep deprivation.

Individuals with severe sleep-disordered breathing can have higher rates of driving accidents than those with a less severe sleep disorder. Self-reported episodes of dozing, or frequent sleepiness while driving, further increase crash risk, irrespective of sleep apnoea severity.

A recent Australian study (Abeyaratne M et al 2023) of rail incidents among safety critical workers found that the likelihood of an incident increased in those with severe untreated OSA compared with those receiving treatment.

People with narcolepsy present with excessive sleepiness 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 safety critical work. Those with narcolepsy perform worse than control subjects on simulated driving tasks and are more likely to have (motor vehicle) accidents.

Excessive worktime sleepiness

The priority in terms of safety is to determine whether the coal mine worker experiences excessive sleepiness and/or inattentiveness while working.

Witnessed episodes of dozing at work, unsatisfactory work performance, or workplace incidents may indicate these impacts and should prompt further investigation. During this process, patterns of sleepiness and other effects can be discussed with the coal mine worker to explore potential causes, including medical, lifestyle, and/or work-related factors such as shift work.

Workplace reports relevant to possible sleep disorders should address factors that may directly indicate excessive worktime sleepiness, or other observations that may plausibly be caused by inattention or cognitive impairment. These factors may include:

- any perceived change in behaviour or performance over time (consider the nature of the change (sudden or progressive) and include any known circumstances, at work or elsewhere, that might help explain the change)
- interpersonal conduct (this may include how the coal mine worker interacts with others in their extended workgroup – for example, interacting with their colleagues or suppliers)
- emotional tolerance to problems and challenges
- frequency of redo, prolonged task completions, or apparent inattention to detail
- frequency of near-miss incidents
- frequency of any ‘reportable’ incidents
- any other operational indices that might indicate a concern for example, reliability, sleepiness, attendance and punctuality. Note: Legitimate reported impressions are based on the manager, supervisor, or team leader comparing:
  - the subject individual’s conduct and performance, with,
  - their knowledge and experience of (i) others performing a similar role; and (ii) the business unit’s operational expectations of the role.

Increased sleepiness may also occur in otherwise healthy people and may be due to:

- prior sleep deprivation i.e. less than 6 hours (restricting the time for sleep)
- poor sleep hygiene habits for example:
  - variable sleep times
  - excessive napping
  - consuming caffeine, nicotine (or other stimulants) or alcohol too close to bedtime
  - large, heavy meals right before bedtime
  - screen time use in the hour before bed.
  - exercise or other mentally stimulating activities right before bed

- irregular sleep-wake schedules (for example, rosters/shift work)
- the influence medications and other drugs on sleep.

These factors may increase the severity of sleep disorders and result in more severe cognitive impairment and sleepiness in coal mine workers with otherwise mild or moderately severe sleep disorders.

Fatigue

Fatigue is a state of physical, mental or emotional impairment which can arise from both work-related and non-work-related sources. It can develop over the short or long term, affecting an individual's health and reducing their ability to function safely (Safe Work Australia, 2025).

Sleep disorders can cause fatigue, and lead to reduced concentration, co-ordination and reaction times, and contribute to poor decision making. These effects increase the risk of errors, work-related incidents and other hazards that negatively impact coal mine worker health and safety.

Fatigue is also associated with a wide range of co-morbidities and chronic illnesses, which may or may not be associated with increased sleepiness.

Coal mine workers with symptoms of fatigue in association with poor work performance or incidents may require further assessment. They should be assessed for a range of medical conditions and related factors, including the following:

- medical conditions, including anaemia, diabetes, hypothyroidism, cardiac disease, chronic obstructive pulmonary disease, and sleep disorders
- psychological conditions, including depression, anxiety, and post-traumatic stress disorder (PTSD)
- occupational factors, including rosters, shift work, bullying, and conflict
- social factors, including family and relationship problems.

Effectively identifying and managing fatigue is crucial to minimising risk and protecting coal mine worker health and safety.

Under the s19 of the Work Health and Safety Act (2011) a PCBU must eliminate or minimise the risk of fatigue, so far as is reasonably practicable. Workers also have a duty to take reasonable care for their own safety and health and make sure their acts or omissions don't adversely affect the health or safety of others.

Duties and accountabilities

Duties and accountabilities associated with implementing the requirements of this Standard

A clear understanding of duties and accountabilities, along with effective communication, assists in maximising both the effectiveness of health protection that this Standard offers, and the health and safety of the NSW coal industry workforce.

Approved medical practitioner

- The AMP must ensure their assessment and management of the coal mine worker is in accordance with this Standard.
- The AMP is accountable for assessing fitness for work using their clinical judgement and providing a health certification that is in accordance with this Standard. Where anyone other than the AMP completes any part of any Order 45 health assessment, the AMP retains non-delegable, full accountability for the accuracy and quality of all assessments.
- The AMP must ensure a copy of the coal mine worker's relevant health assessment results and clinical findings are provided to their treating doctor when further investigation and management is required. This should also include:
  - The position performed by the coal mine worker.
  - Any self and/or work reported fatigue related events.
- The AMP is not responsible for the management of any identified sleep disorders.

Coal mine worker

- The coal mine worker should attend, and fully participate in, each required Order 45 health assessment and/or health assessment review and any further sleep related investigations.
- The coal mine worker should provide accurate, complete answers to questions within any health assessment.
- The coal mine worker should declare any medical condition at their Order 45 health assessment that may affect their capacity to perform their position without undue risk to themselves and/or others. Coal mine workers who are not sure, should consult with the AMP and/or their treating doctor about whether a condition may affect their fitness for work.

Coal Services

- Coal Services is responsible for the timely, effective communication of this Standard to the NSW coal industry and to key stakeholders.
- Coal Services is responsible for providing the NSW coal industry with supporting guidelines to assist stakeholder understanding and interpretation of this Standard.
- Coal Services, through the internal and external AMP network, is responsible for providing Order 45 health assessments.

General practitioner or treating doctor

- The coal mine worker's General Practitioner (GP) or treating doctor is responsible for the management of any identified sleep disorders.

Person conducting business or undertaking

- The PCBU is responsible for determining the coal mine worker's risk category based on the position they will be undertaking.
- The PCBU is responsible for ensuring that the coal mine worker has a health assessment and/or has attended any health assessment reviews required under Order 45 and other relevant legislation.
- The PCBU must notify the AMP assessing the coal mine worker if any health monitoring requirements in Schedule 14 of the NSW Work Health and Safety Regulation 2025 is required, in addition to the standard monitoring under Order 45.
- The PCBU must notify the AMP assessing the coal mine worker if any remote work is undertaken by the coal mine worker.
- The PCBU is responsible for considering and, where appropriate, implementing any recommended workplace remedial measures identified in the health certification provided by the AMP.

Sleep Physician

When a sleep physician is required, they are responsible for:

- Advising on the diagnosis and clinical management of any identified sleep disorders.
- Assessing overall levels of clinical control and stability of identified sleep disorders.
- The sleep physician is not responsible for determining the coal mine worker's fitness for work. This remains the responsibility of the AMP.

NSW Coal Industry Health Standard review and feedback process

A comprehensive review process is essential to ensure information detailed in this Standard remains current and maintains best practice standards.

All NSW Coal Industry health standards will be reviewed 12 months after initial publication and then every 5 years thereafter, or sooner, as required. This Standard will be reviewed by the Coal Services Standing Health Committee, subject matter experts, and the Coal Services Clinical Governance Committee.

Any feedback received, including identified changes or updates required to this Standard will be incorporated into the review process and considered accordingly.

Feedback on this Standard can be provided by email to shc@coalservices.com.au.

Health assessment components

Sleep Health assessments and investigations

AMPs must use the following assessments and investigations when determining a coal mine worker's sleep health and/ or factors that may affect a coal mine worker's ability, health and/or safety in performing their designated position.

Routine investigations

All coal mine workers undergo the following health examinations as part of the Order 45 health assessment, regardless of their risk category or position they will be undertaking at a coal mine.

- Medical history of a diagnosed sleep disorder. This involves identifying diagnosed sleep disorders and assessing the adequacy of management.
- Any concerns regarding sleep
- Screening for specific risk of obstructive sleep apnoea (OSA) using the STOP-Bang questionnaire (see appendix one).
- Consideration of reported fatigue related safety incidents
- Body mass index (BMI)

Note there are other self-reported sleep screening tools available, including the Epworth Sleepiness Scale (ESS) (see appendix 2), which the approved medical practitioner may choose to use in addition to the routine investigations listed above.

Secondary investigations

Following completion of the above routine health examinations, coal mine workers may require further investigations to assess the presence of a sleep disorder and/or confirm that an existing diagnosed sleep disorder is adequately managed.

The need for secondary investigations should be determined in accordance with recommendations in this Standard.

Sleep Study referrals

A sleep study is used to identify and diagnose sleep disorders, including obstructive sleep apnoea.

Category A and B coal mine workers should be referred to their GP for a type 1 or 2 sleep study referral (see further information on page 20) if they have:

- confirmed or suspected excessive worktime sleepiness including an unexplained sleepiness/loss of consciousness event OR
- a STOP-Bang score of 5 or greater OR
- The presence of other high-risk features including:
  - A BMI of 35kg/m^2 or more with treatment-resistant hypertension (defined as blood pressure requiring at least 3 medications to control) and/or type 2 diabetes OR
  - a BMI 40kg/m^2 or more.

Other risk factors for OSA include: a diagnosis of atrial fibrillation (treated with reversion to sinus rhythm, or persistent despite treatment), poor memory and concentration, morning headaches, and insomnia.

Consequently, any history suggestive of a syndrome of disordered sleep should be referred for further investigation.

Types of sleep studies

Type 1 and 2 sleep studies

While the gold standard test for diagnosing OSA is a Type 1, in-laboratory sleep study with a sleep technician in attendance, a Type 2 unattended home sleep study is also adequate for diagnosis.

Although type 1 and type 2 studies are both suitable for assessing coal mine workers identified at increased risk of OSA on screening, Type 2 sleep studies can underestimate severity. Category A and B coal mine workers who are at very high risk of OSA (i.e. BMI $\geq$40kg/m^2 or BMI $\geq$35kg/m^2 with diabetes and/ or treatment resistant hypertension) and have a negative result on a type 2 sleep study should therefore be referred to a sleep physician for further investigation.

Type 3 and 4 sleep studies

Type 3 and Type 4 sleep tests are generally only used as screening tests for OSA and are not suitable for assessing Category A and Category B coal mine workers for the presence of a sleep disorder. They may be considered in rare or exceptional circumstances where there are significant issues with access to Type 1 or Type 2 sleep studies.

Reporting and interpretation of sleep study results

The results of any coal mine worker sleep study should be interpreted and reported by a sleep physician.

The initial determination of a sleep disorder diagnosis should be based on the report from a sleep physician.

Subsequent management of follow-up should then occur in accordance with guidance within the medical management tables of this Standard.

Refer to appendix 3 for further information regarding sleep studies.

Sleep Physician Referrals

Coal mine workers deemed to be high-risk will require referral to a sleep physician for further assessment and advice on the management of any identified sleep disorder.

This includes Category A and Category B coal mine workers who:

- Have a BMI ≥ 40kg/m^2 OR a BMI ≥ 35kg/m^2 with type 2 diabetes and/or treatment resistant hypertension who return a normal or mildly abnormal type 2 sleep study
- Have moderate to severe OSA and no evidence of satisfactory control using CPAP. The sleep physician referral is required to confirm the diagnosis and treatment options and advise of any ongoing monitoring requirements. If a workplace report describes features of concern, this information should be provided to the sleep physician.
- Have any documented deterioration in risk factors, symptoms or change in safety record.
- Refuse CPAP or are unable to comply with recommended CPAP treatment. The sleep physician referral is required for advice on whether the condition can be adequately managed by other means.
    - Mandibular advancement splints (or other therapies) may potentially be deemed appropriate by the sleep physician in cases where CPAP is not tolerated. In this situation, a repeat sleep study on treatment and MWT is likely to be required.
    - While potentially appropriate for less severe conditions, mandibular advancement splints are not appropriate for first line therapy of Category A and Category B coal mine workers with severe OSA or confirmed OSAS. These coal mine workers should be closely monitored by a sleep physician.
- Are suspected of having narcolepsy or another central disorder of hypersomnolence

Other specialists may be consulted at the recommendation of the sleep physician when the underlying cause of the sleep disorder falls within their treatment speciality. For example, Ear, Nose and Throat specialists.

Repeat sleep studies and management of risk factors

If a coal mine worker is found not to have either OSAS or moderate to severe OSA but carries high-risk features that are likely to be present at subsequent assessments, a sleep physician should be asked to advise on relevant triggers for the coal mine worker's next sleep study in the original referral.

Category A and Category B coal mine workers with untreated mild or moderate OSA with risk factors that deteriorate at subsequent health assessments, such as weight gain of 10 per cent or more, should be referred for sleep physician review within 6 months, preceded by a repeat sleep study as appropriate.

Category A and Category B coal mine workers found to have risk factors such as high BMI, high blood pressure, or diabetes should be referred to their general practitioner as a duty of care for ongoing management.

Treatment and monitoring of OSA and OSAS

CPAP is considered the gold standard treatment for OSA because its use can improve sleep-related symptoms and quality of life. (Pavwoski P, Shelgikar AV 2017).

CPAP is the first-line treatment for most adults with symptomatic moderate-to-severe OSA or mild OSA with significant hypoxemia and/or excessive sleepiness (Hamilton G.S. 2024).

In addition, lifestyle changes and behaviour modification should always be considered to enhance sleep health in those with confirmed OSA. These include:

- Weight loss (reduces airway narrowing and obstruction)
- Maintaining good sleep hygiene
- A non-supine sleeping position (not sleeping on your back)

Other OSA treatment options may be considered on advice of a sleep physician* or other treating specialist, including:

- Mandibular advancement splint
- Surgical correction in those with an upper airway anatomical cause

*Refer to the *Unable to tolerate treatment or refusal of CPAP and Ongoing Monitoring and review* sections on page 16 for further information.

Initial treatment and management of coal mine workers with OSA and OSAS

Category A and Category B coal mine workers who are diagnosed with OSAS or severe OSA should be certified as temporarily unfit for work while a satisfactory response to treatment is established and evidence of compliance and adequate response is provided to the approved medical practitioner.

Those treated with continuous positive airway pressure (CPAP) should use a CPAP machine with a usage meter to allow objective assessment and recording of treatment compliance and satisfactory response to treatment.

Category A and Category B coal mine workers with OSAS or severe OSA may be able to return to work after two weeks of treatment when CPAP compliance reports demonstrate satisfactory compliance and response.

Category A and B coal mine workers who are diagnosed with moderate OSA (without evidence of excessive workplace sleepiness or OSAS) can be certified as fit for work, whilst appropriate treatment is initiated. A review of medical information is then required within 6 months to confirm the condition is being satisfactorily managed, as evidenced by a CPAP compliance report or confirmation by a sleep physician.

Unable to tolerate treatment or refusal of CPAP

Category A and Category B coal mine workers with OSA who refuse or are unable to comply with recommended CPAP should be referred to a sleep physician to assess whether the condition can be adequately managed by other means.

Under these conditions of refusal or unable to tolerate CPAP treatment in the presence of known OSAS or severe OSA or reported fatigue related events, Category A and Category B coal mine workers should be made temporarily unfit until this information can be obtained from their sleep physician.

Under conditions of refusal or unable to tolerate CPAP treatment, a coal mine worker demonstrating a normal MWT test may be certified as fit for work if the following criteria are met:

- the sleep physician confirms the coal mine worker is adherent to their recommended non-CPAP treatment strategies (for example, mandibular advancement splint)
- the coal mine worker has no evidence of obesity hypoventilation syndrome

Any documented deterioration in risk factors, symptoms or change in safety record should trigger a review the treating sleep physician.

Ongoing monitoring and review

Once adherence and adequate response to treatment is evident, the frequency of review will be dependent on the severity of the OSA and the coal mine workers risk category, as outlined in the medical management tables and clinical pathways in this Standard.

The AMP must confirm the coal mine workers OSA is being adequately treated before ongoing fitness for work is established, via information provided by the GP, a CPAP compliance report or information from the treating sleep physician.

A CPAP report of usage for at least the 3 months immediately prior to the review, should be reviewed at each health assessment review. Minimally acceptable compliance with treatment recommendations is defined as use for 4 hours or more per day of use on 70 per cent or more of days in the reporting period.

For a coal mine worker who has been diagnosed with OSA (of any severity), a repeat sleep study may be recommended by the AMP or treating doctor to re-evaluate the management needs of the diagnosed disorder. For example, if the coal mine worker has lost substantial weight, they may no longer require CPAP to manage their OSA, and other treatment options may be suitable. In such cases a validated sleep study and Maintenance of Wakefulness Test (MWT) may support the reduction in therapeutic requirements. Consequently, the coal mine worker may no longer need to provide their CPAP usage reports and undergo review by their sleep physician. However, monitoring of their modifiable risk factors should still occur.

There are currently no reliable usage detection devices available for coal mine workers who are treated with mandibular splints. While potentially appropriate for less severe conditions, they are not appropriate for first line therapy of Category A and Category B coal mine workers with severe OSA or confirmed OSAS. These coal mine workers should be closely monitored by a sleep physician.

Mandibular advancement splints (or other therapies) may potentially be deemed appropriate by the sleep physician in cases where CPAP is not tolerated. In this situation, a repeat sleep study on treatment and MWT is likely to be required.

Monitoring should include an assessment of symptoms, including sleepiness and impacts on cognitive performance. Measurements of wakefulness, such as the 4 by 40-minute MWT may assist in understanding the coal mine worker's treatment needs and support clinical decision making by the assessing specialist.

Narcolepsy and other disorders of hypersomnolence

People 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 hallucinations, all of which present a significant risk for Category A and Category B coal mine workers.

Diagnosis of narcolepsy, idiopathic hypersomnia and other central disorders of hypersomnolence is made on the combination of clinical features, HLA (human leukocyte antigen) 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.

Narcolepsy is present in 0.05 per cent of the population and usually starts in the second or third decade of life. There are two types of narcolepsy – type 1 and 2.

In narcolepsy type 1, sufferers present with excessive sleepiness and can have periods of sleep with little or no warning of sleep onset. Other symptoms include cataplexy (sudden loss of muscle tone precipitated by an emotional stimulus), sleep paralysis and vivid hypnagogic hallucinations. The majority of sufferers of narcolepsy type 1 are HLA-DQB1*06:02 (a serotype) positive.

Narcolepsy type 2 and other central disorders of hypersomnolence, such as idiopathic hypersomnia, often share similar features and are more common than narcolepsy type 1. Sufferers present with excessive daytime sleepiness or an excessive need for sleep, or both. Cataplexy is not present.

Sleepiness in narcolepsy and other hypersomnolence disorders may be managed effectively with scheduled naps and wakefulness promoting medication. Cataplexy is usually treated either with anti-depressants (for example, venlafaxine, tricyclic antidepressants) or sodium oxybate.

The MWT is a test that measures a person's ability to stay awake in a quiet, dark and non-stimulating room. The MWT is used in people with narcolepsy who are receiving treatment, in order to assess the effectiveness of treatment and to quantify daytime sleepiness in those who need to stay awake throughout the day.

Coal mine workers suspected of having narcolepsy or another central disorder of hypersomnolence should be referred to a sleep physician or neurologist for assessment (including a MSLT) and management. If the diagnosis is suspected and supported by a workplace report, they should be certified temporarily unfit for work until there have been no symptoms for 6 months. Category A and Category B coal mine workers should have an annual review with information provided by their treating specialist that their condition is being adequately managed.

Guidelines for medical management

Order 45 health assessments monitor and screen for the presence of any sleep disorders.

In addition to investigations completed as part of the Order 45 health assessment, AMPs must also consider the foreseeable health and/or safety risks to the coal mine worker and/or others arising from both a coal mine worker's capacity to perform the inherent requirements of their position and the workplace environments when assessing and/or issuing a health assessment certificate.

The PCBU is responsible for nominating the coal mine worker's risk category based on the position they will be undertaking. The AMP's health certification should be made against the coal mine worker's risk category detailed in the medical management guidelines within this Standard.

Medical management tables

The medical management tables within this Standard provide guidance to AMPs according to a coal mine worker's:

- identified risk category, i.e.:
  - Category A: Safety critical
  - Category B: Safety sensitive, or
  - Category C: Non-safety sensitive.

For each of the above criteria, the guidelines within the medical management tables advise AMPs on any required actions, including:

- further medical investigations required
- follow-up requirements and frequency of health assessment reviews
- health certifications:
  - AMPs should use the medical management tables in this Standard to guide their overall assessment as to whether a coal mine worker can safely perform their designated position
  - this includes determining the coal mine worker's short-term capacity for work whilst any required further investigations occur
  - where the AMP considers the coal mine worker unfit for the designated position, they should:
    - contact the coal mine worker to advise them of the health certification.
    - contact the PCBU to advise them of the health certification. The AMP should discuss limited detail with the PCBU to maintain privacy and confidentiality
    - consider in discussion with the PCBU, if the coal mine worker would be suitable for other duties. This should occur following the coal mine worker's consent and before the health certification is finalised
- when information about an identified sleep condition is not readily available, it must be sought from the appropriate treating doctor before health certification is made for a new position. When conducting a health assessment, this information should be sought within 3 to 6 months
- a health assessment review may require the coal mine worker to attend an appointment with an AMP in person for repeat testing or examination and/or it may require the AMP to review and assess medical information provided by a treating doctor (without coal mine worker attendance)
- when an early review is required due to a medical abnormality, the health assessment review should focus solely on the identified issue, rather than completing a full health assessment

- even if the coal mine worker has been recommended for routine review, they may still be required to provide updated medical information from their treating doctor at future Order 45 health assessments. Any change or deterioration in the condition should trigger an earlier review.

Coal mine worker education

All coal mine workers suspected of having, or found to have, sleep apnoea or other sleep disorders should be advised about the potential impact on their work tasks and strategies for maintaining fitness for work. General advice should include:

- minimising unnecessary activity at times when normally asleep
- allowing adequate time for sleep
- notify employer if fatigued to determine a safe work plan.
- avoiding alcohol and sedative medications
- resting if sleepy
- ensuring the sleep environment is cool, dark and quiet.

Medical management tables

Table 2: Sleep disorder risk assessment (excessive worktime sleepiness)

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Sleep disorder risk assessment: **Excessive worktime sleepiness**	The priority in terms of safety is to determine whether the coal mine worker experiences excessive sleepiness or inattentiveness while working. Demonstrated excessive workplace sleepiness or inattentiveness may be evidenced by: • A history of persistent self-reported sleepiness at work OR • Workplace reports indicating excessive sleepiness, for example, witnessed episodes of dozing at work, OR unsatisfactory work performance (see page 8 of this Standard for more information on workplace reports relevant to sleep disorders) OR • incident reports plausibly caused by inattention or sleepiness Patterns of sleepiness and other impacts can be explored with the coal mine worker in terms of possible causes, both medical and lifestyle related, or work related, such as shift work. Evidence of excessive sleepiness or inattentiveness in the workplace must prompt further investigation. Category A and Category B coal mine workers should be referred to their GP to organise a sleep physician referral. To protect their safety, the coal mine worker should be certified as temporarily unfit until further investigations have occurred and information is received back from the sleep physician confirming satisfactory management of any identified sleep conditions, or absence of a sleep disorder. If a sleep disorder is diagnosed refer to the relevant medical management table contained within this Standard. **Refer to this medical management table and the *Obstructive sleep apnoea risk assessment pathway* on page 32 for guidance according to the coal mine workers identified risk category.**		
Sleep disorder risk assessment: **Excessive worktime sleepiness**	**Management** Certify as temporarily unfit for work and refer to GP to organise an assessment by a sleep physician if there is evidence of excessive worktime sleepiness, as evidenced by one or more of the following criteria: • a history of persistent self-reported sleepiness at work • workplace reports indicating	**Management** Certify as temporarily unfit for work and refer to GP to organise an assessment by a sleep physician if there is evidence of excessive worktime sleepiness, as evidenced by one or more of the following criteria: • a history of persistent self-reported sleepiness at work • workplace reports indicating	**Management** Certify as fit for work Refer to GP for follow-up

Table 2: Sleep disorder risk assessment (excessive worktime sleepiness)

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	excessive sleepiness • incident reports plausibly caused by inattention or sleepiness The coal mine worker can return to work once information is received from the sleep physician confirming they meet the following criteria: • Satisfactory treatment of any identified sleep conditions as outlined in relevant sections below OR • No identifiable sleep disorder **Follow-up** If a sleep disorder is diagnosed, see relevant section below to guide follow up requirements. If no disorder identified – review as per any comorbidities.	excessive sleepiness • incident reports plausibly caused by inattention or sleepiness The coal mine worker can return to work once information is received from the sleep physician confirming they meet the following criteria: • Satisfactory treatment of any identified sleep conditions as outlined in relevant sections below OR • No identifiable sleep disorder **Follow-up** If a sleep disorder is diagnosed, see relevant section below to guide follow up requirements. If no disorder identified – review as per any comorbidities.	**Follow-up** Routine review

Table 3: Obstructive sleep apnoea risk assessment

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Obstructive sleep apnoea (OSA) risk assessment: STOP-Bang questionnaire score AND the presence of other significant individual risk factors	The STOP-Bang questionnaire identifies coal mine workers at risk of OSA, who should undergo a sleep study. This validated screening tool consists of 8 yes or no questions about **S**noring (self-reported), **T**iredness (self-reported), **O**bserved apnoeas (self-reported), **P**ressure (high blood pressure), **B**ody-mass index (BMI ≥35kg/m2), **A**ge (>50 years), **N**eck circumference and **G**ender (male). A score of one (1) is given to each YES response, with the total score corresponding to the following OSA risk categories: – Low OSA risk = 0 to 2 – Intermediate OSA risk = 3 to 4 – High OSA risk = 5 or more. *Refer appendix one for a copy of the STOP-Bang questionnaire and guidance for health care professionals on completing the STOP-Bang questionnaire.* Males over the age of 50 automatically score 2, without the presence of other risk factors. This is of significance considering 91% of NSW coal mine workers are male, and 26% are over 50 years of age. **Coal mine workers will be referred for a sleep study based on their respective STOP-Bang score and/or presence of other significant risk factors outlined below.** **Significant individual risk factors requiring further investigation** Other individual risk factors are associated with a very high risk for developing OSA. Consequently, coal mine workers with the following risk factors should be referred for a sleep study irrespective of their STOP-Bang score. • a BMI ≥40kg/m^2 OR • a BMI of ≥35m^2 with treatment resistant hypertension and/or type 2 diabetes The presence of atrial fibrillation (treated with reversion to sinus rhythm, or persistent despite treatment) is a further risk factor. Additionally, poor memory and concentration, morning headaches and insomnia may also be presenting features of a sleep disorder that are not included in the STOP-Bang questionnaire. Consequently, any history suggestive of a disordered sleep syndrome should be considered for further investigation. **Refer to this medical management table and the *Obstructive sleep apnoea risk assessment pathway* on page 32 of this Standard for guidance according to the coal mine workers identified risk category.**		
OSA Low risk STOP-bang questionnaire score of 0 to 2	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review

Table 3: Obstructive sleep apnoea risk assessment

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
OSA Intermediate risk STOP-bang questionnaire score of 3 to 4	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of any risk factors **Follow-up** Routine review
OSA High risk STOP-bang questionnaire score of 5 or more * If GP repeats STOP-Bang and worker no longer has a score of ≥5 a sleep study is no longer required. GP should then provide this information back to the AMP.	**Management** Certify as fit for work. AMP to refer worker to their GP to arrange a type 1 or 2 sleep study. * AMP to review the results of the sleep study within 6 months. If no information is received within 6 months the coal mine workers health assessment certificate will expire. If a sleep disorder is diagnosed, see relevant section below. **Follow up** As per identified sleep disorder If no disorder identified – review as per any comorbidities.	**Management** Certify as fit for work. AMP to refer worker to their GP to arrange a type 1 or 2 sleep study. * AMP to review the results of the sleep study within 6 months. If no information is received within 6 months the coal mine workers health assessment certificate will expire. If a sleep disorder is diagnosed, see relevant section below. **Follow up** As per identified sleep disorder If no disorder identified – review as per any comorbidities.	**Management** Certify as fit for work AMP to make duty of care referral to GP for follow-up and management of risk factors. **Follow-up** Routine review
Other high-risk features A BMI of ≥35kg/m^2 with type 2 diabetes OR treatment-resistant hypertension **OR** A BMI of ≥40kg/m^2	**Management** Certify as fit for work and AMP to refer worker to their GP to arrange a type 1 or 2 sleep study. AMP to review the results of the sleep study within 6 months.	**Management** Certify as fit for work and AMP to refer worker to their GP to arrange a type 1 or 2 sleep study. AMP to review the results of the sleep study within 6 months.	**Management** Certify as fit for work AMP to make duty of care referral to GP for management of risk factors

Table 3: Obstructive sleep apnoea risk assessment

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	If no information is received within 6 months the coal mine workers health assessment certificate will expire. If a sleep disorder is diagnosed, see relevant section below. **Follow up** As per identified sleep disorder and other comorbidities **If no sleep disorder is identified by a type 2 sleep study OR AHI <15 the coal mine worker should be referred to a sleep physician for further assessment within 6 months.**	If no information is received within 6 months the coal mine workers health assessment certificate will expire. If a sleep disorder is diagnosed, see relevant section below. **Follow up** As per identified sleep disorder and other comorbidities **If no sleep disorder is identified by a type 2 sleep study OR AHI <15 the coal mine worker should be referred to a sleep physician for further assessment within 6 months.**	**Follow-up** Routine review

Table 4: OSA and OSAS diagnosis and management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Obstructive sleep apnoea	Obstructive sleep apnoea (OSA) diagnosis The initial determination of a diagnosis of obstructive sleep apnoea should be based on a type 1 or 2 sleep study report that is interpreted by a sleep physician. The severity of OSA is usually determined by the frequency of obstructive respiratory events and defined by the apnoea hypopnoea index (AHI), which is the average number of respiratory disturbances per hour of sleep. OSA is generally defined as an AHI of 5 or more events per hour. • mild OSA is defined as an AHI of 4 to 14 events per hour • moderate OSA is defined as an AHI of 15 to 29 events per hour • severe OSA is defined as an AHI of 30 or more events per hour. Obstructive sleep apnoea syndrome (OSAS) In the absence of an internationally agreed definition of obstructive sleep apnoea syndrome, and recognising that depression and OSA symptoms often coexist, the Australian Sleep Association recommends the following guidance criteria: A. Overnight sleep study demonstrates 5 or more breathing events per hour of sleep (AHI ≥ 5). These events may include any combination of apnoea OR hypopnea events. AND B. Symptoms that are not better explained by other conditions: • Two or more of the following: – unrefreshing sleep – persistent daytime fatigue or low energy – neurocognitive impairments, for example, near misses, inattention, reduced concentration, reduced memory, slow learning – mood disturbance, for example, irritability, dysphoria (very unhappy, uneasy, dissatisfied), anxiety. **Refer to this medical management table and the *Obstructive sleep apnoea diagnosis and management pathway* on page 33 of this Standard for guidance according to the coal mine workers identified risk category.**		
Mild sleep apnoea AHI of 5-14 events per hour on a diagnostic sleep study Without excessive worktime sleepiness or other features of OSAS	**Management** Certify as fit for work AMP to make duty of care referral to GP to manage any risk factors **Follow up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP to manage any risk factors **Follow up** Routine review	**Management** Certify as fit for work AMP to make duty of care referral to GP to manage any risk factors **Follow up** Routine review

Table 4: OSA and OSAS diagnosis and management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Moderate sleep apnoea AHI of 15 to 29 events per hour on a diagnostic sleep study Without excessive worktime sleepiness or other features of OSAS	**Management** Certify as fit for work AMP to refer coal mine worker to their GP for management of OSA and risk factors. AMP to review medical information provided by the GP and/or CPAP compliance report OR sleep physician within 6 months to confirm the condition is being managed satisfactorily. If no medical information is provided to the AMP then the coal mine workers health assessment certificate will expire. **Follow up** Annual review of information provided by the GP and/or CPAP compliance report or sleep physician confirming ongoing adequate management. If no medical information is provided to the AMP the coal mine workers health assessment certificate will expire	**Management** Certify as fit for work AMP to refer coal mine worker to their GP for management of OSA and risk factors. AMP to review medical information provided by the GP and/or CPAP compliance report OR sleep physician within 6 months to confirm the condition is being managed satisfactorily. If no medical information is provided to the AMP then the coal mine workers health assessment certificate will expire. **Follow up** Once it is confirmed the OSA is being adequately treated and managed by their GP, return to routine review.	**Management** Certify as fit for work AMP to make duty of care referral to GP to manage OSA and any risk factors **Follow up** Routine review
Severe sleep apnoea AHI of 30 events or more per hour on a diagnostic sleep study Without excessive worktime sleepiness or other features of OSAS	**Management** Coal mine workers with newly diagnosed severe sleep apnoea should be certified as temporarily unfit for work and referred to their GP for management of OSA and risk factors. The coal mine worker should remain temporarily unfit for work until information is received that the following criteria are met: • the coal mine worker has started and is compliant with treatment AND	**Management** Coal mine workers with newly diagnosed severe sleep apnoea should be certified as temporarily unfit for work and referred to their GP for management of OSA and risk factors. The coal mine worker should remain temporarily unfit for work until information is received that the following criteria are met: • the coal mine worker has started and is compliant with treatment AND	**Management** Certify as fit for work AMP to make duty of care referral to GP to manage OSA and any risk factors

Table 4: OSA and OSAS diagnosis and management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	• there is satisfactory response to treatment (this should include a minimum of 2 weeks CPAP usage data after starting treatment) OR • information provided by a sleep physician confirming satisfactory management of the OSA The AMP should consider the nature of the work and information provided when determining the coal mine worker's fitness for work. For an initial health assessment for the role, evidence of adequate control must be obtained prior to certifying as fit for work **Follow up** AMP to review CPAP compliance report 3 months after coal mine worker commences CPAP to ensure compliance and satisfactory response treatment. AMP to review medical information annually from the GP and/or CPAP compliance report OR sleep physician report confirming satisfactory OSA management (coal mine worker is not required to be physically present). If no medical information is provided to the AMP the coal mine workers health assessment certificate will expire	• there is satisfactory response to treatment (this should include a minimum of 2 weeks CPAP usage data after starting treatment) OR • information provided by a sleep physician confirming satisfactory management of the OSA The AMP should consider the nature of the work and information provided when determining the coal mine worker's fitness for work. For an initial health assessment for the role, evidence of adequate control must be obtained prior to certifying as fit for work **Follow up** AMP to review CPAP compliance report 3 months after coal mine worker commences CPAP to ensure compliance and satisfactory response to treatment. AMP to review medical information at 12 months from the GP and/or CPAP compliance report OR sleep physician report confirming satisfactory OSA management (coal mine worker is not required to be physically present). Once it is determined that the condition is being satisfactorily managed, return to routine review. If no medical information is provided to the AMP the coal mine workers health assessment certificate will expire.	**Follow up** Routine review.
Obstructive sleep apnoea	**Management**	**Management**	**Management**

Table 4: OSA and OSAS diagnosis and management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
syndrome (OSAS) (irrespective of severity of sleep apnoea)	The coal mine worker should be certified as temporarily unfit for work if: • they have been diagnosed with OSAS (refer to text for definition); or • if they have a STOP-Bang score greater than or equal to 3 and self-reported excessive worktime sleepiness (ESS ≥ 11/24); or • if they have a self-reported excessive worktime sleepiness (ESS ≥ 11/24 and AHI ≥ 5); or • if they have AHI greater than or equal to 5 and their workplace report is consistent with a syndrome of disordered sleep. The coal mine worker should remain temporarily unfit for work until the following information is received: • the coal mine worker is compliant with treatment AND • there is satisfactory response to treatment (this should include a minimum of 2 weeks CPAP usage data after starting treatment) • OR information is provided by a sleep physician confirming satisfactory management. For an initial health assessment for the role, evidence of adequate control must be obtained prior to clearance for work **Follow up** AMP to review CPAP compliance report 3 months after coal mine worker	The coal mine worker should be certified as temporarily unfit for work if: • they have been diagnosed with OSAS (refer to text for definition); or • if they have a STOP-Bang score greater than or equal to 3 and self-reported excessive worktime sleepiness (ESS ≥ 11/24); or • if they have a self-reported excessive worktime sleepiness (ESS ≥ 11/24 and AHI ≥ 5); or • if they have AHI greater than or equal to 5 and their workplace report is consistent with a syndrome of disordered sleep. The coal mine worker should remain temporarily unfit for work until the following information is received: • the coal mine worker is compliant with treatment AND • there is satisfactory response to treatment (this should include a minimum of 2 weeks CPAP usage data after starting treatment) • OR information is provided by a sleep physician confirming satisfactory management. For an initial health assessment for the role, evidence of adequate control must be obtained prior to clearance for work **Follow up** AMP to review CPAP compliance report 3 months after coal mine worker	Certify as fit for work Refer to GP for management of OSAS and any risk factors. **Follow up** Routine review.

Table 4: OSA and OSAS diagnosis and management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	commences CPAP to ensure compliance and satisfactory response treatment AMP to complete annual review of information which includes a satisfactory CPAP compliance report OR a report from a sleep physician. If no medical information is provided to the AMP the coal mine workers health assessment certificate will expire.	commences CPAP to ensure compliance and satisfactory response treatment AMP to review information at 12 months which includes a satisfactory CPAP compliance report OR a report from a sleep physician If this information shows satisfactory control, return to routine review. If no medical information is provided to the AMP the coal mine workers health assessment certificate will expire.	

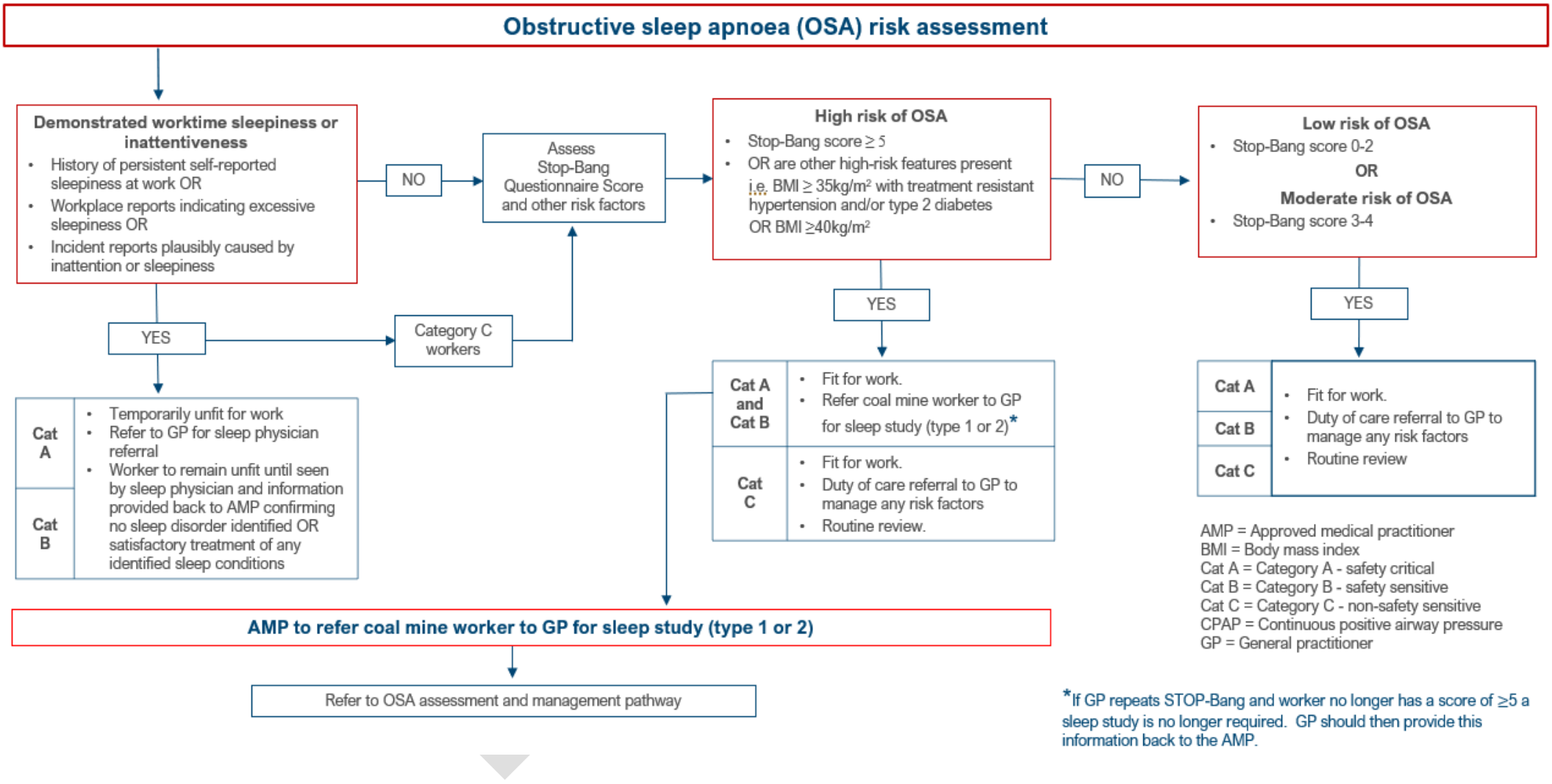
Table 5: Narcolepsy and other disorders of hypersomnolence

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Narcolepsy and other disorders of hypersomnolence	For an initial health assessment, coal mine workers with narcolepsy or other disorders of hypersomnolence should be certified as temporarily unfit until information is provided by their treating specialist confirming the condition is being adequately managed and the criteria in the medical management table below is met before they are certified as fit for work. Coal mine workers suspected of having narcolepsy or other disorders of hypersomnolence should be referred to their GP for a sleep physician or neurologist referral for assessment (including a MSLT) and management. If the diagnosis is suspected and supported by a workplace report, they should be certified temporarily unfit for work until information is provided by the treating specialist that the criteria in the medical management table below is met. Category A and Category B coal mine workers should have an annual health assessment review with information provided by their treating specialist to the AMP, confirming that their condition is being adequately managed. For further information on narcolepsy and other disorders of hypersomnolence refer to page 17 of this Standard.		
Narcolepsy and idiopathic hypersomnia	**Management** For an initial health assessment, the coal mine worker should be certified as temporarily unfit for work until information is provided by the sleep physician confirming 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 • symptoms have been appropriately controlled for 6 months; and • normal sleep latency is present on MWT (on or off medication). The AMP should consider the nature of the work and information provided when determining the coal mine workers fitness for work. For subsequent health assessments, where the coal mine worker is moving into a higher risk category, they should be treated as an initial assessment.	**Management** For an initial health assessment, the coal mine worker should be certified as temporarily unfit for work until information is provided by the sleep physician confirming 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 • symptoms have been appropriately controlled for 6 months; and • normal sleep latency is present on MWT (on or off medication). The AMP should consider the nature of the work and information provided when determining the coal mine workers fitness for work. For subsequent health assessments, where the coal mine worker is moving into a higher risk category, they should be treated as an initial assessment.	**Management** For an initial health assessment, the coal mine worker should be certified as temporarily unfit for work until information is obtained from the sleep physician that the condition is being adequately managed. Otherwise, the AMP may certify the coal mine worker as fit for work and review information provided by the sleep physician confirming the condition is being adequately managed at each subsequent health assessment.

Table 5: Narcolepsy and other disorders of hypersomnolence

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	Otherwise, the AMP may certify the coal mine worker as fit for work and review information provided by the sleep physician within 6 months confirming 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 • symptoms have been appropriately controlled for 6 months; and • normal sleep latency is present on MWT (on or off medication). If no medical information is provided to the AMP then the coal mine worker's health assessment certificate will expire. The AMP should consider the nature of the work and information provided when determining the coal mine worker's fitness for work. **Follow up** Annual review of information provided by the sleep physician confirming the condition is being adequately managed.	Otherwise, the AMP may certify the coal mine worker as fit for work and review information provided by the sleep physician within 6 months confirming 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 • symptoms have been appropriately controlled for 6 months; and • normal sleep latency is present on MWT (on or off medication). If no medical information is provided to the AMP then the coal mine worker's health assessment certificate will expire. The AMP should consider the nature of the work and information provided when determining the coal mine worker's fitness for work. **Follow up** Annual review of information provided by the sleep physician confirming the condition is being adequately managed.	**Follow up** Routine review

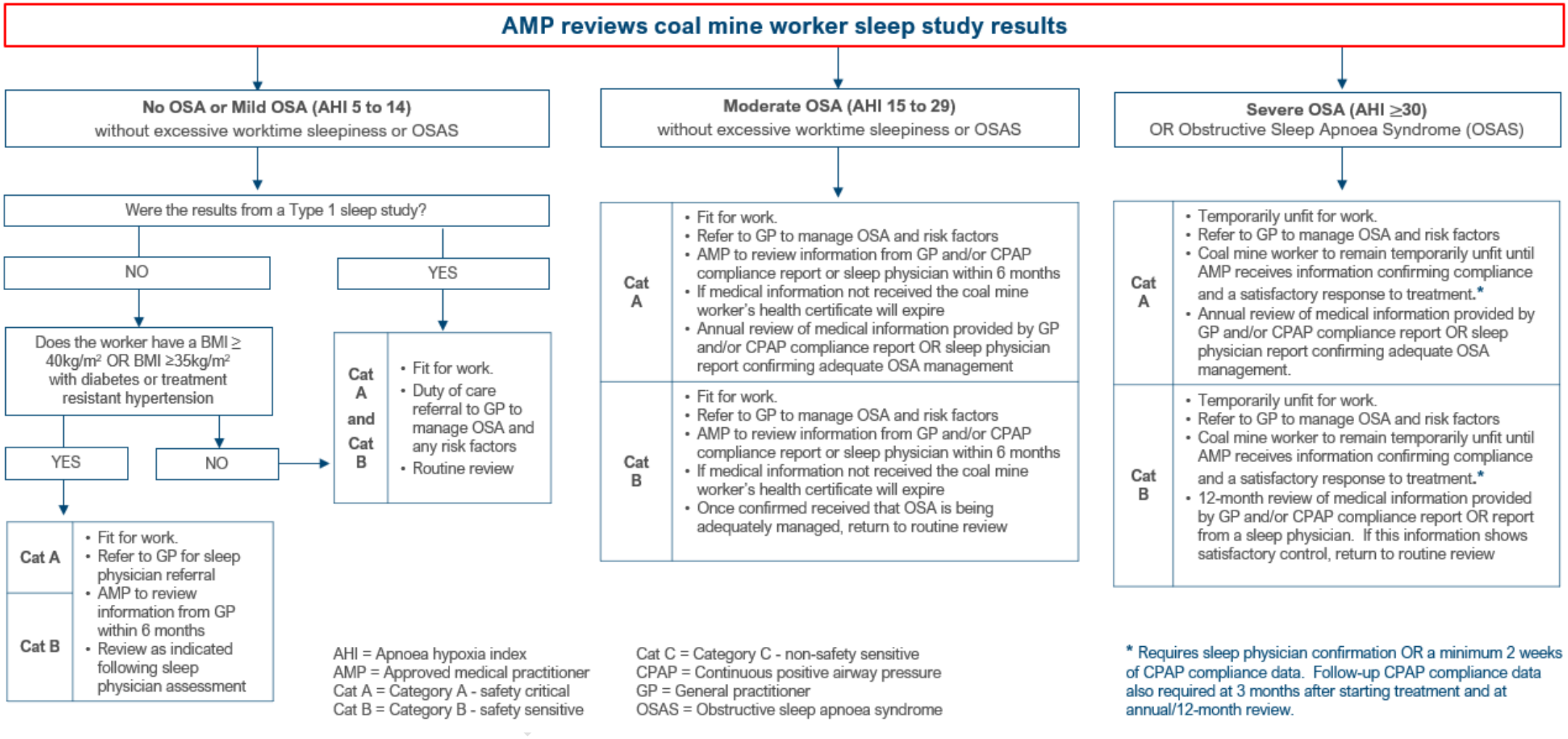
Obstructive sleep apnoea risk assessment pathway



AMP = Approved medical practitioner
BMI = Body mass index
Cat A = Category A - safety critical
Cat B = Category B - safety sensitive
Cat C = Category C - non-safety sensitive
CPAP = Continuous positive airway pressure
GP = General practitioner

*If GP repeats STOP-Bang and worker no longer has a score of ≥5 a sleep study is no longer required. GP should then provide this information back to the AMP.

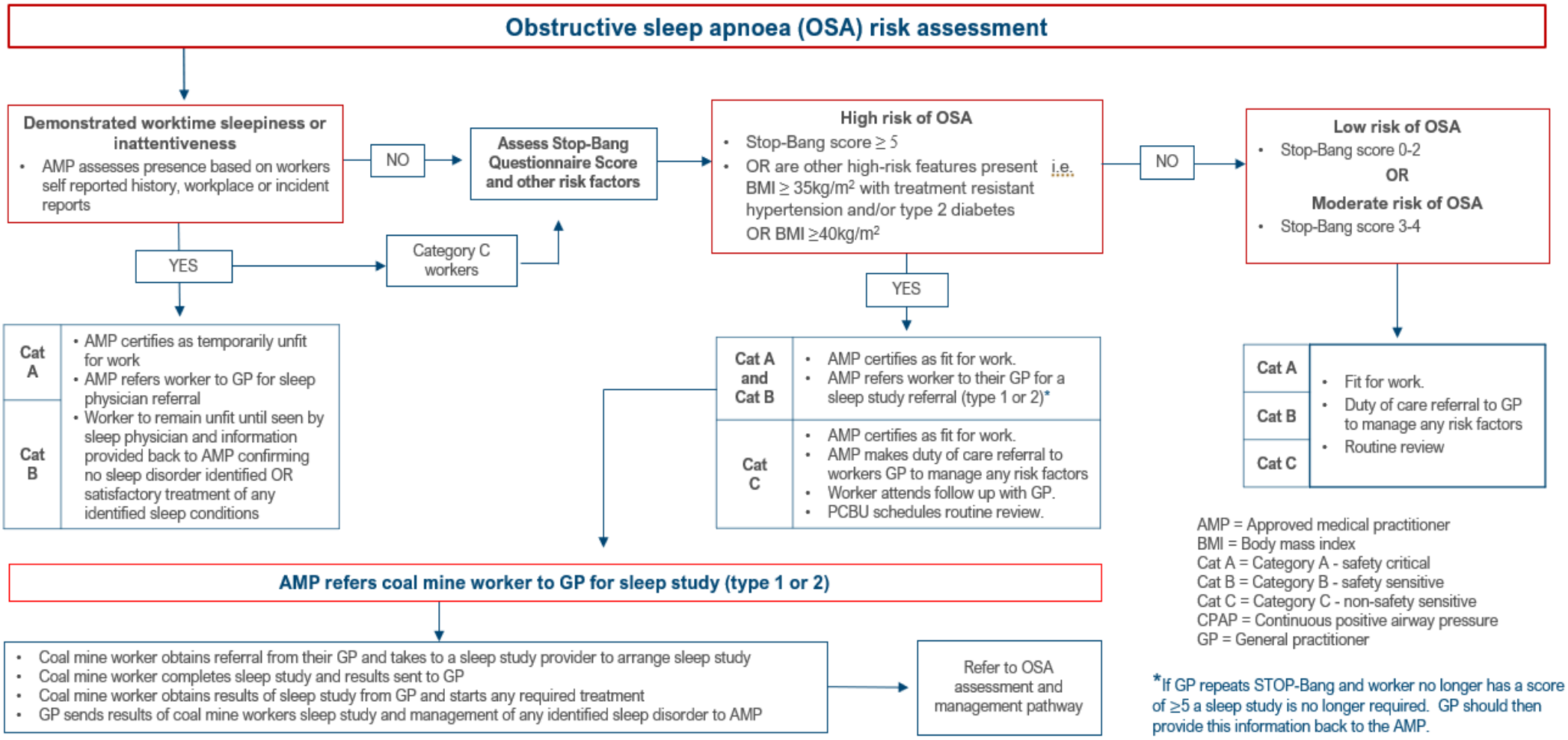
Obstructive sleep apnoea diagnosis and management pathway



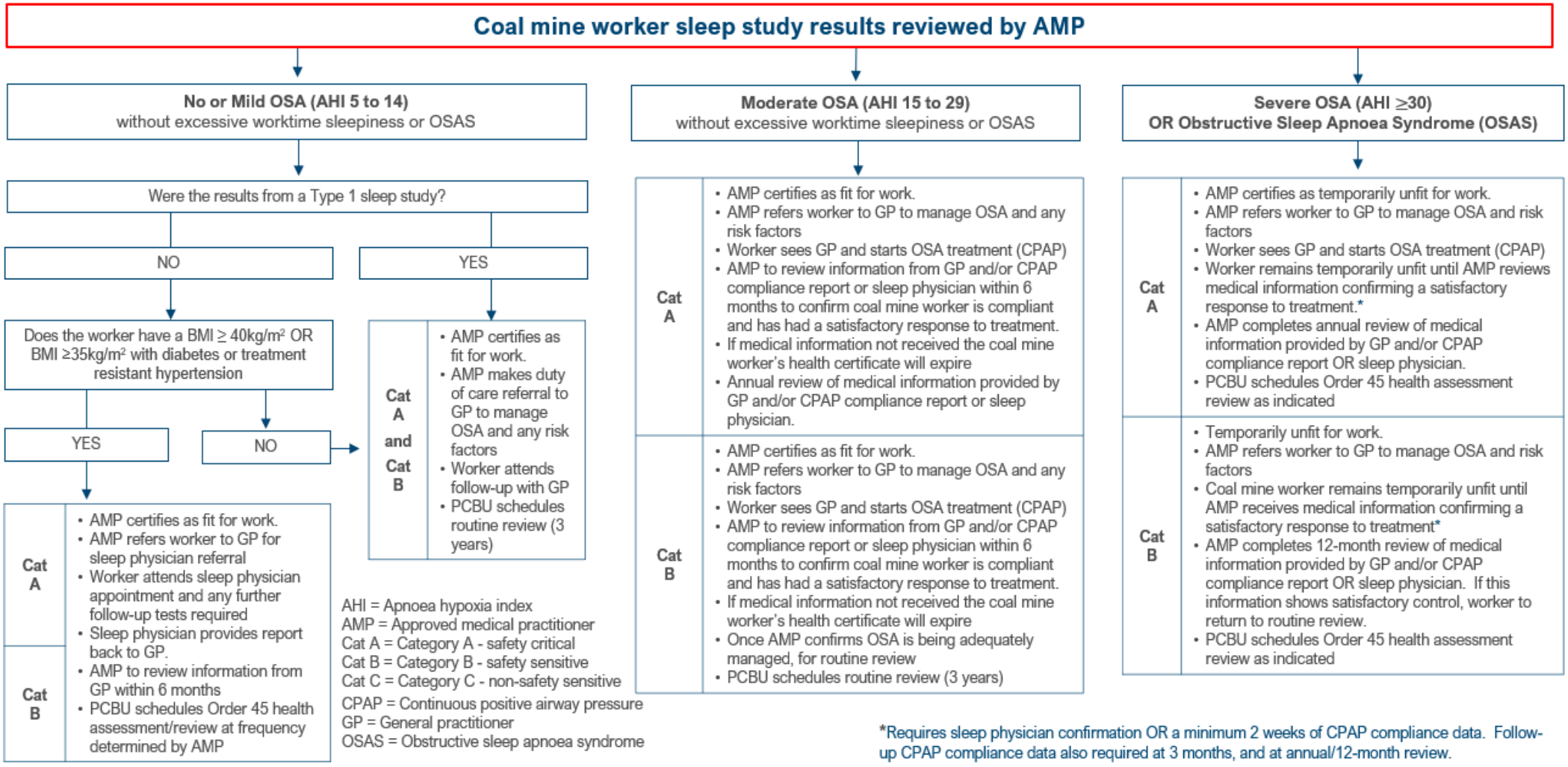
AHI = Apnoea hypoxia index
AMP = Approved medical practitioner
Cat A = Category A - safety critical
Cat B = Category B - safety sensitive
Cat C = Category C - non-safety sensitive
CPAP = Continuous positive airway pressure
GP = General practitioner
OSAS = Obstructive sleep apnoea syndrome

* Requires sleep physician confirmation OR a minimum 2 weeks of CPAP compliance data. Follow-up CPAP compliance data also required at 3 months after starting treatment and at annual/12-month review.

Obstructive sleep apnoea risk assessment pathway (roles defined)



Obstructive sleep apnoea diagnosis and management pathway (roles defined)



Considerations before certifying fitness for work

When assessing coal mine workers with identified sleep conditions or abnormalities, a health assessment of a coal mine worker's fitness for work must consider whether the coal mine worker has the capacity to start or continue in a position with or without restrictions, and what the foreseeable health and safety risks (if any) are to the coal mine worker and/or others. This must happen even if the outcomes of further investigations are still pending.

This Standard provides guidance on the features to look for to determine whether a condition is likely to be sufficiently stable. Evidence showing that a condition has been previously identified and monitored, with good control of any relevant risk factors, may allow a coal mine worker to be certified fit for work with early review.

The AMP should record the reasons for the coal mine worker's health certification. Those reasons would be based on the clinical evidence that supports the application of this Standard to the coal mine worker, including but not limited to the information from the sleep physician.

When assessing a coal mine worker's fitness for work, the AMP must consider the following factors:

- The coal mine worker's position and the potential for harm if an identified sleep condition was to lead to unavoidable incapacity
- The overall severity of the changes, if any, in the coal mine worker's health.
- The duration and stability of the change if any.
  - Is this the first abnormal result?
  - Has it been present for some time, and is it stable or declining?
  - Has there been good control of identified risk factors?
  - Does the coal mine worker have a demonstrated history of regular review and good compliance with treatment?
- The likelihood that the result of a test will be confirmed as abnormal.
- The psychosocial state and psychosocial work environment of the coal mine worker.
- Is it a new position? i.e. the condition may need to be fully investigated to determine whether the coal mine worker is actually fit for the position.
- If a new sleep condition is identified at an Order 45 health assessment, the coal mine worker may be certified as temporarily unfit for work or fit for work, subject to a health assessment review, depending on the identified condition and clinical findings. Consideration should be given to whether the condition is well managed and is compatible with the risk category classification of the position.
- In cases where the AMP assesses the coal mine worker as unfit for their designated position, the AMP must advise the coal mine worker of the health certification.
- In cases where the AMP considers the coal mine worker unfit for their designated position, they must contact the PCBU to advise of the health certification. They should also consider, in discussion with the PCBU, if the coal mine worker would be suitable for other duties. This should occur with the coal mine worker's consent and before the health certification is finalised.

Appendices

Appendix One: STOP-Bang questionnaire

STOP BANG Questionnaire

Full name			
Date of birth			
CS Health reference number			
Date of completion			
Height (cm)		Weight (kg)	
BMI		Neck Circumference (cm)	

1. Snoring		
Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?	Yes ☐	No ☐
2. Tired		
Do you often feel tired, fatigued, or sleepy during daytime?	Yes ☐	No ☐
3. Observed		
Has anyone observed you stop breathing during your sleep?	Yes ☐	No ☐
4. Blood Pressure		
Do you have or are you being treated for high blood pressure?	Yes ☐	No ☐
5. BMI		
BMI more than 35 kg/m^2	Yes ☐	No ☐
6. Age		
Age over 50 years old?	Yes ☐	No ☐
7. Neck circumference – *measured by Health Care Professional*		
Neck circumference greater than 40cm?	Yes ☐	No ☐
8. Gender		
Gender male?	Yes ☐	No ☐
****Total Score**		

** Add up the 'yes' responses = Total Score

Adapted from: Chung F. et al *STOP Questionnaire:- A Tool to Screen Patients for Obstructive Sleep Apnoea*, Anesthesiology 2008; 108:812–21.

Appendix One: STOP-Bang questionnaire

Guidance for health professionals on completing the STOP-Bang questionnaire

In the STOP-Bang questionnaire above:

- Questions 1-3 are self-reported by the coal mine worker.
- Questions 4 – 8 are objectively measured by the health professional completing the STOP-Bang questionnaire. See notes below on how these measurements should be obtained.

Question 4. Blood pressure

- Measure the coal mine workers blood pressure. Tick yes on the STOP-Bang questionnaire if the worker has:
  - A blood pressure reading of ≥ 140mmHg systolic and/or ≥ 90mmHg diastolic, and remaining abnormal on repeat testing OR
  - A history of hypertension, currently controlled with medication (regardless of current blood pressure reading)

Question 5. BMI.

- Measure the coal mine workers weight, height and then calculate their BMI.
- Tick yes on the STOP-Bang questionnaire if the BMI is ≥ 35kg/m2

Question 6. Age

- Confirm the workers age by checking their date of birth.
- Tick yes on the STOP-Bang questionnaire if the worker is ≥50 years of age.

Question 7. Neck circumference.

- Measure the coal mine workers neck circumference using the following method:
  - Place a tape measure around the coal mine worker's neck at the level of the Adam's apple (cricothyroid membrane).
  - Take the measurement is taken in a horizontal plane with the head in a resting, upright position.
- Tick yes on the STOP-Bang questionnaire if the coal mine worker has a neck circumference of ≥40cm

Question 8.

- Confirm the coal mine worker's gender at birth.
- Tick yes on the STOP-Bang questionnaire if the worker is male.

Appendix two: Epworth Sleepiness Scale

Epworth Sleepiness Scale

How likely are you to nod off or fall asleep in the following situations, in contrast to feeling just tired? This refers 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. It is important that you answer each question as best you can.

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

	Would never nod off 0	Slight chance of nodding off 1	Moderate chance of nodding off 2	High chance of nodding off 3
Sitting and reading				
Watching TV				
Sitting, inactive, in a public place (e.g., in a meeting, theater, or dinner event)				
As a passenger in a car for an hour or more without stopping for a break				
Lying down to rest when circumstances permit				
Sitting and talking to someone				
Sitting quietly after a meal without alcohol				
In a car, while stopped for a few minutes in traffic or at a light				

Add up your points to get your total score. A score of 10 or greater raises concern: you may need to get more sleep, improve your sleep practices, or seek medical attention to determine why you are sleepy.

Appendix three: Sleep Study information

Table 5: Summary of Type 1- 4 sleep study device measurements.

	Type 1 device (attended polysomnography)	Type 2 device (Portable, unattended polysomnography)	Type 3 device (portable home sleep apnoea test)		Type 4 device (single or dual bio parameter recording)
				Example of a type 3 device	
Minimal measurements	• Electroencephalogram (EEG) • Electrooculography (EOG) • Chin electromyography (EMG) • Electrocardiogram (ECG) • Airflow • Respiratory effort • Oxygen saturation	• EEG • EOG • Chin EMG • ECG • Airflow • Respiratory effort • Oxygen saturation	Minimum 4 parameters, typically: • Two ventilation parameters e.g. respiratory movement or airflow • Heart rate or ECG • Oxygen saturation (No EEG)	Peripherial arterial tonometry (PAT), oximetry, heart rate, snoring, actigraphy, body position	Only 1 or 2 parameters measured (typically oxygen saturation, airflow, chest movement)
Body position	Measured or observed	Possible but optional	Possible	Yes	No
Sleep staging	Yes	Yes	No	No	No
Sleep surrogate	Not applicable	Not applicable	Possible	Yes (PAT actigraphy)	No

Reference List

Abeyaratne M, Casolin A and Luscombe GM (2023) Safety incidents and obstructive sleep apnoea in railway workers. Occupational Medicine, 73(2):97-102.

Assessing fitness to drive 2022

Charlton, J.L., Di Stefano, M., Dow, J., Rapoport, M.J., O'Neill, D., Odell, M., Darzins, P., & Koppel, S. Influence of chronic Illness on crash involvement of motor vehicle drivers: 3rd edition. Monash University Accident Research Centre Reports 353. Melbourne, Australia: Monash University Accident Research Centre. (2021)

Chung F, Yegneswaren B, Liao P, Chung S, Vairavanathan S, Islam S, Khajehdehi A, Shapiro C. STOP questionnaire: a tool to screen patients for obstructive sleep apnea. Anesthesiology. 2008 May; 108(5):812-21. doi: 10.1097/ALN.0b013e31816d83e4

Hamilton, G S. Sleep: A key concern for primary care. Australian Journal of General Practice Volume 53, Issue 6, June 2024. doi: 10.31128/AJGP-03-24-7192.

Kushida CA, Littner MR, Morgenthaler T, Alessi CA, Bailey D, Coleman J Jr, Friedman L, Hirshkowitz M, Kapen S, Kramer M, Lee-Chiong T, Loube DL, Owens J, Pancer JP, Wise M. Practice parameters for the indications for polysomnography and related procedures: an update for 2005. Sleep. 2005 Apr;28(4):499-521. doi: 10.1093/sleep/28.4.499.

McArdle N, Reynolds AC, Hillman D, Moses E, Maddison K, Melton P, Eastwood P. Prevalence of common sleep disorders in a middle-aged community sample. J Clin Sleep Med. 2022 Jun 1;18(6):1503-1514. doi: 10.5664/jcsm.9886.

National Standard for Assessment of Rail Safety Workers 2024

Pavwoski P, Shelgikar AV. Treatment options for obstructive sleep apnea. Neurol Clin Pract. 2017 Feb;7(1):77-85. doi: 10.1212/CPJ.0000000000000320. PMID: 29849228; PMCID: PMC5964869

Work Health and Safety Regulation 2025 - NSW Legislation

Queensland Mines Rescue Service Guideline for the medical assessment of mines rescue personnel

Safe Work Australia. Health monitoring guide for registered medical practitioners.

Safe Work Australia. Managing the risk of fatigue at work. Code of Practice 2025.

Work Health and Safety Act 2011 (NSW)

Coal Services Pty Limited
A.B.N. 98 099 078 234

Corporate Office

T +61 2 8270 3200
F +61 2 9262 6090

Level 21, 44 Market Street
SYDNEY NSW 2000

PO Box Q1895
Queen Victoria Building NSW 1230

www.coalservices.com.au