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NSW Coal Industry Diabetes Health Standard

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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 NSW coal 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 Diabetes Health Standard* is the fourth 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. They also 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 Diabetes Health Standard* provides guidance to approved medical practitioners to support consistent, evidence-based clinical decision making relating to diabetes. The Standard specifies the investigations and follow-up actions required when assessing a coal mine worker with diabetes and determining their fitness for work.

We extend our gratitude to the Coal Services Standing Health Committee and Professor Shamasunder Acharya for their efforts in developing this Standard, in collaboration with industry stakeholders and relevant medical specialists.

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Contents

Foreword

Abbreviations and acronyms

Glossary

Introduction

Coal Services	1
Role of Coal Services	1
Health surveillance scheme for NSW coal mine workers	2

Scope 2

Background 3

NSW Coal Industry Health Standards	3
What are the NSW Coal Industry Health Standards	3
Benefits of NSW Coal Industry Health Standards	3

Risk category guidelines 4

Risk categories	5
Evidence base	6

Diabetes Health Standard 7

Purpose of the Diabetes Health Standard	7
Diabetes	7
Prevalence of diabetes	9
Impact of diabetes on coal mine worker health and safety	9
Hypoglycaemia	9
Severe hypoglycaemic events	10
Impaired hypoglycaemia awareness	10
Hyperglycaemia	10
Longer term effects of poorly controlled diabetes	10

Duties and accountabilities 12

Approved medical practitioner	12
Coal mine worker	12
Coal Services	12
Endocrinologist or treating specialist	13
General practitioner or treating doctor	13
Person conducting business or undertaking	13

NSW Coal Industry Health Standard review and feedback process 14

Health assessment components	15
Routine investigations	15
Secondary investigations	15
Guidelines for medical management	20
Medical management tables	21
Diabetes screening and risk assessment	21
Diabetes management	25
Type 2 diabetes	25
Insulin treated diabetes	28
Severe hypoglycaemic event	31
Clinical pathways	32
Diabetes screening and risk assessment pathway	32
Diabetes management pathway	33
Considerations before certifying fitness for work	34
Appendices	35
Appendix A: Fitness for work assessments	35
Appendix B: Clarke Hypoglycaemia awareness questionnaire	36
Appendix C: Use of electronic diabetes devices in the NSW coal industry	37
Reference list	38

Abbreviations and acronyms

AHPRA	Australian Health Practitioner Regulation Agency
AMP	Approved medical practitioner
BGL	Blood glucose level
CGM	Continuous glucose monitor
CS Health	Coal Services Health
DKA	Diabetic ketoacidosis
GP	General practitioner
HbA1c	Glycated haemoglobin
PCBU	Person conducting a business or undertaking
RACGP	Royal Australian College of General Practitioners

Glossary

Term	Definition
Approved medical practitioner (AMP)	A medical practitioner who is registered by AHPRA to practice medicine in Australia, complies with the Clinical and Service Standard, and is approved by Coal Services to undertake Order 45 health assessments.
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.
Blood glucose level (BGL)	A measure of the amount of glucose in the blood stream. Also known as blood sugar level.
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.
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 AMPs 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 (PCBU). 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 glucose monitor (CGM)	A small wearable electronic device that continually measures glucose levels throughout the day and night, via a sensor inserted under the skin. The CGM wirelessly transfers glucose data via bluetooth to a mobile phone, other receiver or compatible insulin pump to allow real time glucose monitoring. CGMs can provide alerts or alarms when glucose levels fall above or below a target range. If used with a compatible insulin pump, some systems can automatically adjust insulin delivery based on the real-time glucose readings.
Diabetes	Otherwise known as diabetes mellitus, is a chronic condition characterised by too much glucose in the blood. This occurs when the body makes little or no insulin (Type 1 diabetes) or it is unable to use the insulin it does produce, effectively (Type 2 diabetes).
Diabetic ketoacidosis (DKA)	An acute complication of diabetes, characterised by hyperglycaemia, high ketones in the blood or urine and metabolic acidosis (low blood pH). It occurs with prolonged low insulin levels which causes the body to break down fat for energy. This can cause a build-up of ketones in the blood, which are acidic and toxic to the body in large amounts, potentially leading to loss of consciousness, coma and death.

Term	Definition
Duty of care referral	A referral made by the AMP 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 AMP.
Endocrinologist	A medical doctor who specialises in diagnosing and treating conditions relating to the endocrine system, which includes hormonal, glandular and metabolic issues. They manage conditions such as diabetes, thyroid disorders, osteoporosis, fertility issues, menopause and metabolic disorders.
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, considering any foreseeable risk to the health and/or safety arising from the coal mine worker's condition. A fitness for work assessment is separate to an Order 45 health assessment.
Flash glucose monitor	A small, wearable medical device that measures glucose levels via a sensor inserted under the skin. Glucose readings are retrieved by manually scanning a smart phone or other compatible reader over the sensor to access data on demand.
General practitioner (GP)	A medical doctor who holds 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.
Gestational diabetes	A type of diabetes that develops during pregnancy. It occurs when pregnancy hormones make the body's cells resistant to insulin and the pancreas cannot produce enough extra insulin to manage blood glucose. It affects approximately 8-10% of pregnancies in Australia and is usually diagnosed during routine screening at 24-28 weeks gestation.
Gliptin (DPP-4 inhibitors).	Dipeptidyl peptidase-4 inhibitors (DPP-4s) commonly known as gliptins are a group of medications used to treat type 2 diabetes. Gliptins are usually a second or third choice of medication prescribed to improve type 2 diabetes control. They act to increase the amount of insulin released by the pancreas after eating and reduce the amount of glucose released into the blood stream by the liver.
GLP-1 receptor agonists	Glucagon-Like Peptide-1 medications, known as GLP-1 receptor agonists are medications used to treat type 2 diabetes. They are administered subcutaneously via an injector pen and help to control BGLs by stimulating insulin release, suppressing glucagon, slowing gastric emptying and promoting satiety. They are also used to assist with weight management. Common types of GLP-1 medications in Australia include Ozempic, Trulicity, Victoza and Mounjaro.

Term	Definition
Glucagon	A medication used as the first-line, emergency treatment for severe hypoglycaemia when the person is unconscious, experiencing seizures or unable to safely consume oral glucose. It is administered as an injection by another person, and acts by stimulating the liver to release stored glucose into the bloodstream to stop seizures and restore consciousness.
Glycosuria	The presence of excessive sugar (glucose) in the urine. It is most commonly caused by high blood sugar levels due to untreated or poorly controlled diabetes, or in some cases issues with kidney function and with newer types of diabetes medications, SGLT2 inhibitors.
HbA1c (Glycated Haemoglobin)	A blood test that measures the average blood glucose level over the past 10-12 weeks. It is used to diagnose type 2 diabetes and to assess long-term diabetes control.
Health assessment	Refers to the health examinations of a coal mine worker or prospective coal mine worker that meets certain criteria. The assessment must have been: • completed within the previous three (3) years • assessed against the position and risk category • completed by an AMP • in the form approved by and provided to Coal Services • 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 AMP after the completion of a health assessment, health assessment review, or retirement health assessment. The certificate must: • contain the information in response to items 1 to 13 in Schedule 2 of Order 45 • be provided to the PCBU who requested the health assessment, health assessment review, or retirement health assessment • be in the form approved by and provided to Coal Services • be approved by Coal Services.
Health assessment review	A review of a health condition(s) identified during a coal mine worker's health assessment, health assessment review, or health examination(s), including a deferred health examination(s). A review may be a one off or at defined intervals and must meet certain criteria. The review must have been: • assessed against the position and risk category • completed by an AMP • in the form approved by and provided to Coal Services • approved by Coal Services.
Health certification	A fitness for work determination by an AMP that is documented on a health assessment certificate. The health determination has limited medical information to support the PCBU to create a safe system of work. It follows the completion of health examinations as outlined in Schedule 1 of Order 45 and any health assessment review(s) which assess the ability of a coal mine worker or prospective coal mine worker to perform the position and risk category as outlined in Order 45, s 6(b)(iii) and (iv).
Hypoglycaemia	Otherwise known as a 'hypo', low blood glucose or low blood sugar. It is defined as a blood glucose level of $\leq 3.9\text{mmol/L}$, which can occur in people with diabetes who take insulin or oral medications (sulfonylureas). Common symptoms include weakness, shakiness, sweating, light-headedness, dizziness and lack of concentration. Treatment requires immediate consumption of fast-acting glucose to prevent further drops in blood glucose and progression to a severe hypoglycaemic event.

Term	Definition
Hyperglycaemia	Is when there is too much glucose in the blood, otherwise known as high blood glucose or high blood sugar. It occurs in people with diabetes when the body has too little insulin or it cannot use insulin effectively and is defined as a BGL of ≥ 11.1 mmol/L. Symptoms include excessive thirst, frequent urination, fatigue, and blurred vision. If left untreated symptoms can progress to confusion and disorientation, nausea, vomiting, loss of consciousness or coma (see diabetic ketoacidosis) typically when BGL is >15 mmol/L.
Impaired hypoglycaemia awareness	Occurs where the pathophysiological symptoms that arise in response to mild or severe hypoglycaemia are reduced or absent and the person loses the ability to detect the early symptoms of hypoglycaemia. In such cases, symptoms may be recognised by others before they are recognised by the person, and the person is more likely to have episodes of severe hypoglycaemia.
Insulin	A hormone produced by the pancreas that regulates blood glucose levels by allowing cells to absorb glucose for energy and preventing hyperglycaemia. In diabetes, when the body cannot produce sufficient insulin or blood glucose levels remain too high despite other treatments, synthetic insulin is used to treat the condition. It is administered by daily injections or insulin pumps. Insulin treatment can increase the risk of hypoglycaemia, and therefore requires regular blood glucose monitoring, hypoglycaemia awareness and the ability to promptly treat hypoglycaemia if it occurs.
Insulin pump	A small, wearable, battery powered device used to deliver a continuous flow of rapid acting insulin via a thin tube inserted under the skin. It can be used as an alternative to multiple daily insulin injections to help people with insulin treated diabetes to manage their blood glucose levels.
Ketone	Ketones or ketone bodies are chemicals produced by the body when it breaks down fat for energy instead of glucose. They can become elevated during fasting, prolonged exercise or low carbohydrate intake. In the context of diabetes, high levels of ketones in the blood or urine are a sign of insufficient insulin which can lead to a diabetic ketoacidosis.
Ketonuria	The presence of excessive ketone bodies in the urine. It indicates that the body is breaking down fats for energy instead of glucose, which can be an indicator of diabetic ketoacidosis and uncontrolled diabetes.
Meglitinide	An oral medication used to treat type 2 diabetes by stimulating the pancreas to release insulin right before a meal. Meglitinides can increase the risk of hypoglycaemia and therefore require regular blood glucose monitoring, hypoglycaemia awareness and the ability to promptly treat hypoglycaemia if it occurs.
Metformin	An oral medication used as the first-line treatment for type 2 diabetes when blood glucose levels aren't adequately controlled by diet and exercise alone. It acts to improve insulin sensitivity, reducing the amount of glucose produced by the liver and helping the body absorb more glucose from the blood. When used alone it has a very low risk of causing hypoglycaemia.
Occupational and environmental physician	A medical doctor who has completed the training program of the Faculty of Occupational & Environmental Medicine which is part of the Royal Australasian College of Physicians (RACP) and is registered with AHPRA 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 <i>Coal Industry Act 2001</i> (NSW).

Term	Definition
Person conducting a business or undertaking (PCBU)	Person conducting a business or undertaking (PCBU) has the same meaning given to that term under the <i>Work Health and Safety Act 2011</i> (NSW) s 5 (as amended from time to time or replaced).
Pre-diabetes	A condition in which BGLs are higher than normal, although not high enough to be diagnosed with Type 2 diabetes. It is a risk factor for developing type 2 diabetes and is characterised by impaired glucose tolerance and/or impaired fasting glucose. It is diagnosed through a blood test which checks HbA1c, fasting BGL or oral glucose tolerance (2-hour BGL as part of an oral glucose tolerance test).
Prospective coal mine worker	A person who is seeking to commence work for the first time at a NSW coal mine or coal handling preparation plant for a PCBU. 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.
Random blood glucose test	Measures a person's BGL at any time of the day, regardless of when the person last ate. It is taken by a finger-prick (capillary) test, to screen for the presence of hyperglycaemia and the potential for diabetes or via a venous blood sample, which can diagnose diabetes if the BGL is ≥ 11.1 mmol/L combined with symptoms of hyperglycaemia.
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	Refers to the Order 45 health assessment surveillance interval, which is three (3) yearly.
Satisfactory diabetes control	As defined in this Standard, satisfactory diabetes control includes: • a HbA1c of less than 9%*; and • Evidence of regular monitoring; and • Compliance with prescribed medication; and • Absence of end-organ effects likely to affect safety *This level of control references an occupational standard and not a general HbA1c target for satisfactory control for individuals with diabetes.
Severe hypoglycaemic event	A medical emergency in which a person experiencing hypoglycaemia is unable to treat the hypoglycaemia themselves and requires another person/s to assist with or administer treatment. It is characterised by symptoms such as confusion, slurred speech and irrational behaviour, which left untreated can progress to seizures, loss of consciousness and potential death.
SGLT2 inhibitor	Sodium Glucose Co-Transport 2 inhibitors, known as SGLT2 inhibitors are a type of medication used to treat type 2 diabetes. They lower blood glucose levels by blocking the kidney's reabsorption of glucose, causing excess glucose to be excreted via urine. They also come in combinations with metformin and DPP-4 inhibitors.
Sulfonylurea	An oral medication used to treat type 2 diabetes by stimulating the pancreas to produce more insulin and lower blood glucose levels. Sulfonylureas can increase the risk of hypoglycaemia and therefore require regular blood glucose monitoring, hypoglycaemia awareness and the ability to promptly treat hypoglycaemia if it occurs.
This Standard	Refers to the <i>NSW Coal Industry Diabetes Health Standard</i> .

Term	Definition
Treating specialist	As defined in this standard includes an endocrinologist or a consultant physician specialising in diabetes.
Type 1 diabetes	A chronic, autoimmune condition where the body's own immune system destroys beta cells in the pancreas that produce insulin. This leads to a loss of insulin production and hyperglycaemia requiring life-long insulin therapy and blood glucose monitoring for survival.
Type 2 diabetes	A chronic condition where the body becomes resistant to the normal effects of insulin and/or gradually loses its capacity to produce enough insulin, leading to hyperglycaemia.

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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 the health and safety of the NSW coal industry.

Our vision: To deliver a world-class, sustainable health and safety service to an evolving industry, enabling a healthier 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 operates under the provisions set out in the *Coal Industry Act 2001* (NSW) (the Act) s 9 regarding approved companies. We exercise these functions in accordance with s10(1) of the Act.

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

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 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 non-occupational health related conditions that may impact a coal mine worker's safe work performance. This includes screening for the presence of diabetes.

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 (AMPs) for Order 45 compliance through various channels.

Scope

This Standard applies to all 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 coal mine workers with diabetes.

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 diabetes in the NSW coal industry.

It does not include information on the medical management of diabetes outside the coal mining environment, which is the role of the coal mine worker's general practitioner (GP) or treating specialist.

Background

NSW Coal Industry Health Standards

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

Approved medical practitioners 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 their position performed and/or the work environment(s), if the coal mine 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 at 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 worker's 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
- support clearer, more structured discussions with coal mine workers about health assessment outcomes, expectations, and health certification decisions, improving engagement and shared understanding.

Risk Category Guidelines

Risk categories

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.

Risk category	Definition
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.

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Evidence base

The medical guidance and health certification criteria outlined in this Standard have been developed with reference to published evidence and recognised best practice standards relating to the screening, monitoring and management of diabetes and its potential impact on fitness for work.

Diabetes can lead to both acute and chronic health risks that may impact a coal mine worker's ability to safely perform their work. Where evidence specific to the coal mining environment is limited, this Standard draws on relevant research and guidance from other safety-critical industries, including the Australian road and rail sectors, to inform its development.

The *National Standard for the Health Assessment of Rail Safety Workers* (NTC 2024) was used as a key reference to guide approaches to assessing fitness for work for safety critical (Category A) and safety sensitive (Category B) roles and determining appropriate follow-up and monitoring requirements. Where appropriate, adaptations were then made to reflect the specific operational, regulatory, and risk profile of the NSW coal industry.

The Australian National Driver Medical Standards set out in *Assessing Fitness to Drive* (Austroads and NTC 2022) provide established criteria and guidelines for managing health conditions such as diabetes, which may impact ability to drive safely. These national driver standards are relevant for both private and commercial drivers within the NSW coal industry and were considered and incorporated to support consistent, risk-based fitness for work assessments.

The *Monash University Accident Research Centre Reports* (Charlton et al. 2021) were reviewed to inform understanding of the relationship between diabetes, motor vehicle crash risk, and driving performance impairment. Findings from this research were considered relevant when assessing roles within the NSW coal industry that involve safety-critical tasks, including vehicle and equipment operation.

Additional evidence and guidelines from relevant health bodies and professional organisations was reviewed as part of the development process including the Australian Diabetes Society, American Diabetes Association, Diabetes Australia and the Royal Australian College of General Practitioners. Where published evidence was limited, or not directly transferrable to the NSW coal industry, subject matter expert input, including endocrinologists, occupational and environmental physicians, and NSW coal industry representatives, was used to support discussion, interpretation, and adaption of the evidence.

Diabetes Health Standard

Purpose of the Diabetes Health Standard

The NSW Coal Industry Diabetes Health Standard has been developed to:

- support approved medical practitioners to identify and assess whether coal mine workers with diabetes have adequate diabetes control to safely undertake their position and risk category within a NSW coal mine
- support the early identification of coal mine workers at risk of diabetes
- ensure coal mine workers with a known history of diabetes 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
- support consideration of relevant occupational and non-occupational factors by the AMP that may influence diabetes control
- enable a process for coal mine workers who have diabetes to remain at work or safely return to work and receive appropriate monitoring and management
- help prevent comorbidities and end-organ complications associated with diabetes.

Diabetes

Diabetes is a chronic metabolic disorder characterised by elevated blood glucose levels (hyperglycaemia). It develops when the body either stops producing insulin, doesn't make enough, or doesn't use insulin properly after becoming resistant to its effects.

Insulin is a hormone produced by the pancreas which regulates blood glucose levels (BGLs) by moving glucose from the bloodstream into cells of the body to be used as energy. If insulin is absent or inefficient, glucose then builds up in the blood instead of entering the cells causing hyperglycaemia.

Symptoms of prolonged hyperglycaemia and diabetes include excessive thirst and urination, fatigue, hunger, dizziness, blurred vision, slow-healing wounds, mood changes, and, in the case of Type 1 diabetes, unexplained weight loss.

Type 1 diabetes

Type 1 diabetes is an autoimmune condition where the body's own immune system mistakenly destroys insulin producing beta cells in the pancreas which then stops insulin production. It usually presents in childhood, adolescence and in adults under 30 years of age but can occur, less frequently in older adults.

Type 1 diabetes is diagnosed by a combination of symptoms (such as excessive thirst, frequent urination, unexplained weight loss and fatigue) and blood tests to confirm the presence of hyperglycaemia, insulin deficiency, and auto immune nature of type 1 diabetes. This includes:

- BGL testing: fasting BGL ≥ 7.0 mmol/L, or random BGL ≥ 11.1 mmol/L or HbA1c $\geq 6.5\%$
- Diabetes autoantibody testing: presence of anti-GAD, ICA and IA2 auto antibodies to confirm the autoimmune response.
- C-peptide testing: which indicates the pancreas is producing little or no insulin of its own

Blood or urine ketone testing is also often performed at diagnosis. The presence of high ketones indicates risk of diabetic ketoacidosis (DKA) which is common to new cases of type 1 diabetes.

Type 1 diabetes requires lifelong insulin therapy, whilst balancing food intake, exercise and regularly monitoring blood glucose levels (BGL) to ensure adequate control. This is usually done using a blood glucose meter with a finger prick blood tests or continuous glucose monitoring using a wearable device.

Type 2 diabetes

In Type 2 diabetes, the body becomes gradually resistant to the normal effects of insulin and gradually loses capacity to produce enough insulin to adequately control blood glucose levels.

Type 2 diabetes is diagnosed through a blood test with either a fasting BGL of ≥ 7.0 mmol/L, a random BGL of ≥ 11.1 mmol/L or a HbA1c of $\geq 6.5\%$.

It is thought to be caused by a combination of genetic predisposition and modifiable risk factors including obesity (particularly a high waist circumference) and physical inactivity. For this reason, many cases are thought to be preventable or can be slowed through healthy eating, exercise and weight control. Type 2 diabetes most commonly develops after 45 years of age, however it is increasingly occurring in younger age groups. Other risk factors include ethnicity and health conditions such as high blood pressure, high cholesterol or polycystic ovarian syndrome.

Type 2 diabetes treatment focuses on lifestyle modifications (healthy eating, exercise and weight loss) to lower BGLs and improve insulin sensitivity. If adequate control is unable to be achieved through diet and exercise alone, medication is required. Metformin is typically the first-line medication, which is then supplemented with other oral or injectable medications followed by insulin as needed.

Pre-diabetes

Pre-diabetes is a condition in which BGLs are higher than normal, although not high enough to be diagnosed with Type 2 diabetes (National Diabetes Services Scheme 2022).

Pre-diabetes is characterised by impaired glucose tolerance and/or impaired fasting glucose. It is diagnosed through a blood test with either a fasting BGL of 6.1-6.9 mmol/L, a random BGL of 7.8-11.0 mmol/L or a HbA1c of 6.0-6.4%.

Pre-diabetes has no signs or symptoms which makes it challenging to diagnose. It is a risk factor for developing type 2 diabetes and cardiovascular disease.

Risk factors for pre-diabetes include:

- having a family history of type 2 diabetes or pre-diabetes
- being from an Aboriginal, Torres Strait islander, Pacific Islander, South Asian, Middle Eastern or North African background
- being overweight or obese
- being inactive
- having high blood pressure or high cholesterol
- having polycystic ovary syndrome.

People who have pre-diabetes can delay or prevent developing type 2 diabetes by making healthy lifestyle changes. Coal mine workers with pre-diabetes should include a duty of care referral to their GP for management of risk factors including regular physical activity, healthy eating, weight loss and maintaining a healthy weight and not smoking.

Other types of diabetes

In addition to Type 1 and Type 2 diabetes other types of diabetes include:

- Gestational diabetes: diabetes which develops during pregnancy
- Type 3c diabetes: diabetes caused by damage to the pancreas e.g. by pancreatitis, cancer or cystic fibrosis or surgical removal of the pancreas
- Latent autoimmune diabetes in adults (LADA): Also known as Type '1.5' this is an autoimmune form of diabetes similar to Type 1 but develops slowly in adults over 30.

Management of coal mine workers with these other types of diabetes should be guided by the medications used to treat the diabetes and the coal mine worker risk category as outlined within the medical management tables within this Standard.

Remission of Type 2 diabetes

An HbA1c below 6.5% without the use of glucose lowering medication for at least 3 months would constitute remission of type 2 diabetes. However, relapse is common and therefore periodic surveillance (with BGL and HbA1c) is highly recommended.

Prevalence of diabetes

Order 45 health assessments monitor and screen for the presence of diabetes which can pose significant health and safety risks for coal mine workers.

CS Health coal mine worker periodic health data for 1 Jan 2023 – 31 December 2025 (29,286 workers) showed:

- 3.6% (1062) coal mine workers reported a history of diagnosed diabetes
- 1.1 % (315) coal mine workers recorded a BGL of ≥ 11.1 mmol/L
- 2.5 % (729) coal mine workers were positive for glycosuria*

*Note: Glycosuria on urinalysis is not a sensitive screening tool for diabetes and can be caused by factors other than diabetes. A urinalysis is conducted as part of routine Order 45 health assessments to test for the presence of blood, protein and glucose and screen for a range of conditions and health issues.

In 2022 an estimated 5.1% or just over 1.3 million Australians were living with diagnosed diabetes. This included adults (≥ 18 years) with type 1 diabetes, type 2 diabetes and other diabetes, excluding gestational diabetes (Australian Bureau of Statistics 2022). However true prevalence is likely to be much higher (estimated 8-10% of the Australian population) due to under diagnosis and under reporting.

Type 2 diabetes currently accounts for 87.6% of all diabetes in Australia.

It is estimated that sixteen out of 100 adults in Australia has pre-diabetes (National Diabetes Services Scheme 2022). The prevalence of diabetes has increased steadily in recent years and is estimated to increase 50% over the next 20 to 25 years, principally due to the increase in an aging population, obesity and sedentary lifestyles (Charlton et al 2021).

Impact of diabetes on health, safety and fitness for work

In coal mining environments, poorly controlled diabetes can have both short and long-term impacts on a coal mine worker's ability to safely undertake their required work tasks.

Maintaining satisfactory diabetes control is essential, particularly those in safety-critical (Category A) and safety sensitive (Category B) roles.

Hypoglycaemia

Risk of hypoglycaemia is the major concern for Category A and Category B coal mine workers with diabetes treated with insulin. It is also a risk with use of other glucose lowering medications, including sulfonylureas and meglitinides. This includes coal mine workers with both type 1 and type 2 diabetes treated with these medications.

Hypoglycaemia can cause immediate physical symptoms including dizziness, shakiness, confusion, slower reaction times and impair judgement leading to an increased risk of accidents, injuries and other work hazards (Charlton et al 2021). Left untreated severe cases can lead to seizures, loss of consciousness, coma and death.

Impairment of consciousness and judgement can develop rapidly.

Identifying coal mine workers who are at risk of hypoglycaemia is therefore a priority when assessing fitness for work.

Potential causes of hypoglycaemia

Hypoglycaemia may be caused by many factors, including:

- alteration to medication
- unexpected exertion
- irregular meals
- alcohol intake
- reduced awareness (see impaired hypoglycaemic awareness section on page 10).

Changes in eating and sleeping patterns and variability in medication administration associated with shift work can impact a worker's ability to maintain control of their blood glucose levels.

Severe hypoglycaemic events

For the purposes of this document, a 'severe hypoglycaemic event' is defined as an event of hypoglycaemia of sufficient severity such that the person is unable to treat the hypoglycaemia themselves and requires another person/s to assist with or administer treatment. It includes hypoglycaemia causing loss of consciousness. Episodes occurring during work time or at any other time of the day or night are relevant to the assessment in relation to this Standard.

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

The management of coal mine workers following a severe hypoglycaemic event is outlined in table 3 on page 33 of this Standard.

Impaired hypoglycaemic awareness

Impaired hypoglycaemic awareness exists when a person does not regularly sense the usual early warning symptoms of mild hypoglycaemia such as sweating, tremulousness, hunger, tingling around the mouth, palpitations and headache. It markedly increases the risk of a severe hypoglycaemic event occurring and is therefore a risk for safety.

Rates of severe hypoglycaemia may be up to seven times higher compared to those who retain hypoglycaemia awareness. Impaired hypoglycaemia awareness occurs in 20 to 25 per cent of people with type 1 diabetes and about 10 per cent of those with type 2 diabetes. Prevalence is higher in older people and in those with a longer duration of diabetes.

Hyperglycaemia

Hyperglycaemia can also have safety implications for coal mine workers. It can cause fatigue, lethargy, blurred vision, irritability, reduced concentration and affect decision making capability.

Severe hyperglycaemia can lead to life threatening conditions like diabetic ketoacidosis (DKA) which causes severe dehydration, confusion, vomiting, abdominal pain and if left untreated potential coma and death.

Longer term effects of poorly controlled diabetes

Longer term poor glycaemic control (hypoglycaemia or hyperglycaemia) can damage the small and large blood vessels in the body, leading to a range of comorbidities including:

- cardiovascular disease and peripheral vascular disease: increased risk of heart attack, stroke and other cardiovascular events
- diabetic nephropathy, leading to chronic kidney disease or failure
- diabetic neuropathy, nerve damage causing pain, tingling or numbness in limbs and autonomic

dysfunction e.g. gastroparesis, urinary tract issues

- diabetic retinopathy, leading to potential vision loss and blindness
- Other complications:
 - Foot ulcers and increased risk of amputations caused by nerve damage and reduced blood circulation
 - Skin and oral health issues- increased risk of infections, gum disease and slower wound healing
 - Cognitive decline – increased risk of Alzheimer’s disease and dementia
 - Musculoskeletal complications – increased risk of bone and joint issues, including reduced joint mobility, joint destruction and increased risk of osteoporosis and fractures.

Monitoring and management of comorbidities is therefore an important consideration for the coal mine worker’s fitness for work, health and wellbeing.

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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
 - Glucose level results (random blood glucose level and urinalysis)
- The AMP is not responsible for the management of a coal mine worker's diabetes.
- The AMP must ensure that any health information collected during Order 45 health assessments is managed in accordance with any relevant privacy legislations. Clinical diagnoses, test results, and detailed medical histories cannot be provided to PCBU's without the explicit consent of the coal mine worker or where required by law.

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 diabetes 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(s) 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 whether a condition may affect their fitness for work should discuss with the AMP and/or their treating doctor.
- The coal mine worker should participate in any discussions with PCBU's that assist them in determining the appropriate risk category for the position they are undertaking.

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.

Endocrinologist/Treating specialist

- When an endocrinologist is required, they are responsible for:
 - advising on the diagnosis and clinical management of diabetes
 - assessing overall levels of clinical control and stability of diabetes
- The endocrinologist is not responsible for determining the coal mine worker's fitness for work. This remains the responsibility of the AMP.

General practitioner or treating doctor

- The coal mine worker's GP or treating doctor is responsible for the diagnosis and management of diabetes.
- The coal mine worker's GP or treating doctor is responsible for providing education and support relating to a diagnosis and management of diabetes.

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 in consultation with the coal mine worker, to comply with section 47 of the *Work Health and Safety Act 2011* (NSW).
- 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 set out in Schedule 14 of the *Work Health and Safety Regulation 2025* (NSW) are 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.

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 required updates 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.

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Health assessment components

Diabetes assessments and investigations

Approved medical practitioners must use the following assessments and investigations when screening for diabetes and determining the adequacy of diabetes control and/ or factors that may affect a coal mine worker's ability, health and/or safety in performing their designated position.

Order 45 required information and health examinations

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:

- Identifying a medical history of diabetes
 - This involves identifying a previous diagnosis of diabetes and assessing the adequacy of management and diabetes control
- Screening for diabetes:
 - Random blood glucose level test AND
 - Urinalysis to test for the presence of glucose (glycosuria)* AND
 - History of symptoms suggestive of hyperglycaemia including:
 - lethargy, polyuria (excessive urine production), polydipsia (persistent thirst and excessive fluid intake), polyphagia, frequent fungal or bacterial infections, blurred vision, loss of sensation, poor wound healing and weight loss.

*Note: Glycosuria on urinalysis is not a sensitive screening tool for diabetes and can be caused by factors other than diabetes. A urinalysis is conducted as part of Order 45 health assessments to test for the presence of blood, protein and glucose and screen for a range of conditions and health issues.

Secondary investigations

Following completion of the above routine health examinations, coal mine workers may require further investigations to confirm a diagnosis of diabetes and required treatment and/or confirm that existing diabetes is adequately managed.

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

Confirmation of satisfactory diabetes control and management.

When assessing fitness for work in coal mine workers with a history of diabetes, further information is required from the coal mine worker's GP or treating specialist to confirm:

- The diabetes diagnosis (type of diabetes and duration)
- The diabetes treatment plan, including list of current diabetes medications and any requirement for use of an insulin pump, continuous glucose monitor (CGM) or flash glucose monitor.
- Compliance with treatment
- If the diabetes is satisfactorily controlled, as evidenced by:
 - The coal mine workers most recent HbA1c result (preferably within 3 months)
 - Awareness of hypoglycaemic symptoms
 - History of hypoglycaemic episodes
 - Co-morbidities and end organ damage

This information is required before finalising the health assessment and fitness for work determination.

HbA1c

HbA1c measures the amount of glucose attached to haemoglobin in red blood cells, which provides a measure of the average blood glucose level over the past 2-3 months. It is used to diagnose diabetes and is a key indicator of how well diabetes is controlled.

General HbA1c targets for optimal diabetes control in most individuals are $\leq 7\%$ to reduce the risk of complications associated with diabetes (RACGP 2025).

The target HbA1c can vary depending on the type of diabetes and age of the coal mine worker.

In this Standard, satisfactory diabetes control refers to a HbA1c of $< 9.0\%$ for occupational purposes to allow for the coal mine worker to continue working with ongoing optimisation of diabetes control.

If the HbA1c is $> 9\%$ but less than 10% the worker should be referred to their GP to review their diabetic management and earlier review period recommended.

If the HbA1c is greater than 10% , Category A and Category B coal mine workers should be certified as temporarily unfit for work, and referred to their GP for further assessment, as there is a greater risk of hospitalisation with intercurrent illness at this HbA1c level.

Fitness for work will be determined by the AMP utilising advice by the treating doctor based on the effectiveness of a management plan to achieve target.

For coal mine workers on insulin treatment, blood glucose monitoring and other related records should be reviewed. The coal mine worker should keep a diary of BGLs, taking rosters and shift patterns into account. This is partly so the coal mine worker knows they are safe for work and partly so that control of their diabetes can be readily checked at their review. In general, at least the last 3 months of blood glucose monitoring records should be reviewed.

Hypoglycaemia

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

The management of severe hypoglycaemic events is summarised in table 3, page 31 of this Standard.

Category A and Category B coal mine workers with diabetes who experience a 'severe hypoglycaemic event' (while at work or at any other time) should be advised to cease safety critical and safety sensitive duties. Such an event requires reassessment of their diabetes management by an endocrinologist before ongoing fitness for work is determined.

If an occurrence of a severe hypoglycaemic event is identified during an Order 45 health assessment (self-reported by the coal mine worker) the AMP should certify the coal mine worker as temporarily unfit for work until seen by an endocrinologist and they provide confirmation that the diabetes is under satisfactory control. Where the AMP considers the coal mine worker unfit for the designated Category A or Category B position, they should discuss with the PCBU, with consent from the coal mine worker, whether they would be suitable for other non-safety critical or non-safety sensitive duties. This should occur following the coal mine worker's consent and before the health certification is finalised.

The minimum time period before Category A and Category B coal mine workers can return to safety critical or safety sensitive work after a severe hypoglycaemic event is generally 6 weeks because it often takes many weeks for patterns of glucose control and behaviour to be re-established and for any temporary 'lack of hypoglycaemia awareness' to resolve. The non-working period will depend on factors such as identifying the reason for the episode, endocrinologist opinion and the nature of the work.

If the occurrence of a severe hypoglycaemic event is identified outside of the Order 45 health assessment process this should trigger a fitness for work assessment. Further guidance relating to fitness for work assessments can be found in appendix A.

Reducing the risk of hypoglycaemia and severe hypoglycaemic events

Coal mine workers with diabetes who are at risk of hypoglycaemia should be advised to take appropriate precautionary steps to help avoid a severe hypoglycaemic event. Education and management should include:

- self-monitoring BGLs before working and at work. The frequency of BGL monitoring should be on the advice of the treating specialist considering the nature of the work and history of control.
- wearing a continuous or flash glucose monitor, preferably with an active hypoglycaemia and hyperglycaemia alert or alarm. Note that the use of these devices requires Bluetooth connection to a smart device which needs to be considered in overall risk management
- not working if their BGL is less than 5 mmol/L or, if using a continuous or flash glucose monitor, the predicted glucose level is showing downward trends into hypoglycaemia range (measured when not working)
- not delaying or missing a main meal
- carrying adequate glucose for self-treatment and access to glucagon when prescribed
- treating mild hypoglycaemia if symptoms occur while working, including:
 - ceasing work as practical
 - self-treating the low BGL
 - checking the BGL 15 minutes or more after the hypoglycaemia has been treated and ensuring it is above 5 mmol/L
 - not recommencing working until feeling well and until at least 30 minutes after the BGL is above 5 mmol/L
- complying with specified medical review requirements (GP or treating specialist).

Impaired hypoglycaemia awareness

Impaired hypoglycaemic awareness may be screened by using the Clarke Hypoglycaemia Awareness Questionnaire (appendix B), which may be particularly useful for people with insulin-treated diabetes of longer duration (more than 10 years) or following a severe hypoglycaemic event or after an incident. When impaired hypoglycaemia awareness develops in a person who has experienced a severe hypoglycaemic event, it may improve in the subsequent weeks and months if further hypoglycaemia can be avoided.

The use of devices such as continuous or flash glucose monitors do not replace the need for a person to be able to sense the warning signs of hypoglycaemia or to compensate for impaired hypoglycaemia awareness.

A coal mine worker with impaired hypoglycaemia awareness should be under the regular care of an endocrinologist or other specialist medical practitioner with expert knowledge in managing diabetes. Any worker who has a lack of hypoglycaemia awareness is generally not fit for work unless their ability to experience early warning symptoms returns.

In managing impaired hypoglycaemic awareness, the treating doctor should focus on aspects of the person's self-care to minimise a severe hypoglycaemic event occurring while working. In addition, self-care behaviours that help to minimise severe hypoglycaemic events in general should be a major ongoing focus of regular diabetes care. This includes education to the coal mine worker on diet and exercise programs, insulin regimens and blood glucose testing protocols.

Hyperglycaemia

Severe hyperglycaemia may change the individual's usual behaviour and decision-making processes and increase fatigability. An HbA1c greater than 9% is a level at which medical intervention is warranted. If the HbA1c level is greater than 10% or a random BGL of ≥ 20 mmol/L, the worker should be categorised temporarily unfit for work and referred to their GP for further assessment and management. Workers with a BGL of ≥ 20 mmol/L are at higher risk of acute decompensation, including the development of diabetic ketoacidosis or hyperosmolar hyperglycaemic state. The AMP should therefore also consider the need for immediate acute assessment via referral to the coal mine workers GP or nearest hospital emergency department (ED).

Coal mine workers with diabetes should be counselled about management of their diabetes during days when they are unwell and should be advised not to work if they are acutely unwell with metabolically unstable diabetes.

Comorbidities and end-organ complications

The presence of diabetes comorbidities and any end-organ complications can impact fitness for work. This includes but is not limited to:

- **Vision** – Poorly controlled diabetes can damage the blood vessels in the eyes leading diabetic retinopathy and other diabetes related eye diseases that can lead to vision impairment and compromise ability and safety in the workplace.
- **Neuropathy and foot care** – Neuropathy can reduce ability to perform safety-critical and safety-sensitive work tasks. Adequate sensation and proprioception are required, for example when operating foot controls in heavy machinery, both of which are impacted by neuropathy. Balance can also be affected, increasing the risk of slips, trips and falls particularly on uneven, wet or unstable surfaces present in coal mining environments.
- **Obstructive Sleep apnoea (OSA)** – Sleep apnoea is a common comorbidity affecting many people with type 2 diabetes. It can have substantial safety implications in the workplace due to its potential to cause excessive sleepiness, decrease alertness, reaction times and impair concentration and judgement, increasing the risk of errors, accidents and other workplace incidents.
- **Cardiovascular** – Poorly controlled diabetes significantly increases the risk of cardiovascular disease and cardiovascular events that may cause sudden incapacity and significantly affect the health and safety of the coal mine worker and/or others on the mine site.

Monitoring for diabetes related comorbidities and end-organ complications is an important aspect of diabetes review and management undertaken by the coal mine worker's GP or treating doctor. This includes:

- Annual optometry/ophthalmology report stating absence of diabetes related ocular complications such as retinopathy with exception of mild retinopathy
- Annual feet assessment by qualified clinician such as podiatrist stating preserved monofilament sensation, vibration sensation and peripheral circulation – classified as low-risk feet
- Optimised blood pressure and lipid management
- No evidence of significant kidney dysfunction as determined by the glomerular filtration rate (GFR) and microalbuminuria status
- No evidence of symptomatic or significant heart disease: recent history of angina, exertional chest pain, dyspnoea, syncope, known coronary artery disease, previous myocardial infarction, heart failure,
- Cerebrovascular disease (transient ischaemic attack, stroke) or peripheral vascular disease (claudication pain, vascular stents, gangrene or ulceration in lower extremities) and if present management is optimised
- OSA management is optimised as needed

At each health assessment or health assessment review the AMP requires information from the coal mine worker's GP or treating doctor, to confirm the presence of any end-organ complications and associated management which may have safety implications and affect fitness for work.

Treatment, management and monitoring of coal mine workers with diabetes

Treatment and BGL monitoring

Type 1 diabetes always requires insulin therapy, close blood glucose monitoring and attention to hypoglycaemia risk.

Insulin is administered subcutaneously (under the skin into fatty tissue) by injection using disposable or reusable insulin pens, syringes or via an electronic insulin pump.

Daily blood glucose monitoring methods include:

- Self-administered finger prick blood tests and a blood glucose meter

- Continuous glucose monitoring (CGM) using a wearable sensor device under the skin to monitor glucose 24 hours/day, which sends data to a smartphone or a pump
- Flash glucose monitoring using a sensor on the upper arm which measures glucose and is displayed when scanned with a reader or a smartphone.

Type 2 diabetes has traditionally been managed with lifestyle changes initially (including diet, physical activity, and weight control), with pharmacological treatment (starting with metformin) then introduced as needed. Stepwise escalation of glucose management is now replaced with earlier introduction of organ protective, prognosis improving medications such as SGLT2 inhibitor and GLP1 analogue. Insulin is then considered if other forms of treatment do not achieve satisfactory control.

All coal mine workers with diabetes (type 1 or type 2) who require medications that pose a hypoglycaemic risk must have access to glucose and a reliable method of monitoring blood glucose levels during their shift. Insulin-treated coal mine workers are generally not considered suitable for isolated or remote work duties unless suitable controls are in place.

The underground setting presents additional challenges, including prolonged shifts, and limited access to emergency support. Coal mine workers with diabetes in these roles must have appropriate glycaemic control and good hypoglycaemic awareness. When there is risk of hypoglycaemic episodes, controls include ensuring team awareness of the condition, ready access to glucose, approved underground-capable BGL monitoring, and avoidance of extended solo work.

Safety risks associated with the use of electronic diabetes devices

The use of electronic diabetes devices such as continuous glucose monitors (CGM), flash glucose monitors and insulin pumps in underground coal mines is governed by safety regulations due to the potential risk of explosion in hazardous areas. These devices are typically battery-powered electronic equipment worn on the body and therefore may present an ignition risk if not appropriately designed or assessed. Electronic devices therefore require a risk assessment and approval by the mine operator prior to use. Approval may require engineering assessment, procedural controls and restrictions, including exclusion from certain work zones.

Many diabetes devices use wireless technologies, such as Bluetooth, to communicate with smartphones, watches and other receivers. The use of these connected devices should also be considered as part of the site's risk assessment and approval process.

Electronic diabetes devices may be susceptible to electromagnetic interference in some work environments. This is particularly relevant for coal mine workers who work near high voltage transmission lines, power generation equipment or other sources of strong electromagnetic fields.

The suitability for use of any electronic diabetes device at should be determined on an individual basis, taking into account:

- information from the device manufacturer
- recommendations from the treating doctor and/or an occupational physician regarding the coal mine worker's diabetes management plan. Prior to this, the coal mine workers treating doctor should be informed about the nature of their work:
 - knowledge of the work environment allows the treating doctor to provide an informed assessment of whether the electronic device is clinically necessary for the coal mine worker's diabetes management, or whether adequate diabetes control and safety could be achieved using an alternative, non-electronic management approach.
 - this information assists the treating doctor in balancing the coal mine worker's medical needs, where possible, with any potential workplace restrictions relating to the use of electronic devices.
- completion of a risk assessment and approval for use of the device in the designated work area by the mine site.

Refer to Appendix C for further information and guidance on the use of electronic diabetes devices.

Guidelines for medical management

Order 45 health assessments monitor and screen for the presence of diabetes.

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 environment(s) 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 risk categories, the guidelines within the medical management tables advise AMPs on any required actions, including:

- further medical investigations required
- follow-up requirements
- 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.
 - discuss with the PCBU whether 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 a diagnosis of diabetes 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.

Medical management tables

Table 2: Diabetes screening and 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
Diabetes screening and risk assessment	Order 45 health assessments monitor and screen for the presence of diabetes. This involves: - Identifying coal mine workers with a history of diagnosed diabetes and assessing the adequacy of management. - Screening for the risk of diabetes - Random blood glucose level (BGL)¹ - Urinalysis (to test for the presence of glycosuria)² - Presence of clinical symptoms³ ¹ On most occasions will be non-fasting, but occasionally workers will have fasted before presenting to their Order 45 health assessment. It should be noted by the AMP if the blood sample is fasting. ² Glycosuria on urinalysis is not a sensitive screening tool for diabetes and can be caused by factors other than diabetes. A urinalysis is conducted as part of Order 45 health assessments to test for the presence of blood, protein and glucose and screen for a range of conditions and health issues. ³ The presence of any clinical symptoms should also be considered in conjunction with any clinical findings. Clinical symptoms suggestive of diabetes include lethargy, polyuria (excessive urine production), polydipsia (persistent thirst and excessive fluid intake), frequent fungal or bacterial infections, blurred vision, loss of sensation (i.e. touch, vibration, cold), poor wound healing and weight loss. If a coal mine worker is symptomatic for hyperglycaemia and has a BGL of ≥ 11.1mmol, the clinical assessment must also consider the risk for acute decompensation (diabetic ketoacidosis or hyperosmolar hyperglycaemic state). Workers with a BGL of ≥ 20mmol/l are at high-risk for acute decompensation, and the AMP should refer the coal mine worker for an immediate assessment to their nearest hospital emergency department (ED) or GP. For an initial health assessment for coal mine workers who report a history of diabetes, the AMP will require medical information to be provided by GP or treating specialist confirming the diabetes diagnosis, treatment regime and the adequacy of diabetes control before the health certification can be finalised. Category A and B coal mine workers should be certified as temporarily unfit for work until this information is received and adequacy of diabetes management can be confirmed.		
Coal mine workers with no known history of diabetes and asymptomatic AND Non-fasting BGL of >7.8 and	Management Certify as fit for work. AMP to make duty of care referral to GP for further assessment and management of any risk factors.	Management Certify as fit for work. AMP to make duty of care referral to GP for further assessment and management of any risk factors.	Management Certify as fit for work. AMP to make duty of care referral to GP for further assessment and management of any risk factors.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
<11.1mmol/L (possible pre-diabetes) AND No glycosuria	Follow-up Routine review.	Follow-up Routine review.	Follow-up Routine review.
Coal mine workers with no known history of diabetes and asymptomatic AND Non-fasting BGL <11.1 mmol/L AND Glycosuria present	Management Certify as fit for work and refer coal mine worker to their GP for further assessment and management. AMP to review the medical information provided by the GP within 6 months. If no information is received within 6 months, then the coal mine worker's health assessment certificate will expire. If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	Management Certify as fit for work and refer coal mine worker to their GP for further assessment and management. AMP to review the medical information provided by the GP within 6 months. If no information is received within 6 months, then the coal mine worker's health assessment certificate will expire. If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	Management Certify as fit for work AMP to make duty of care referral to GP for further assessment and management of any risk factors. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.
Coal mine workers with no known history of diabetes and asymptomatic AND Random BGL of ≥11.1mmol/L and <20mmol/L OR Fasting BGL ≥7mmol/L	Management Certify as fit for work and refer to GP for further assessment to confirm a diagnosis of diabetes and ongoing management. AMP to review the medical information provided by the GP within 3 months. If no information is received within 3 months, then the coal mine worker's health assessment certificate will expire.	Management Certify as fit for work and refer to GP for further assessment and to confirm a diagnosis of diabetes and ongoing management. AMP to review the medical information provided by the GP within 3 months. If no information is received within 3 months, then the coal mine worker's	Management Certify as fit for work AMP to make duty of care referral to GP for further assessment and management of any risk factors.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
+/- glycosuria AND no ketonuria	If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	health assessment certificate will expire. If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.
Coal mine workers with a known or no known history of diabetes and are symptomatic AND Non-fasting BGL of ≥ 11.1 and < 20 mmol/L OR Fasting BGL ≥ 7 mmol/L +/- glycosuria +/- ketonuria	Management Certify as temporarily unfit for work and refer to GP for further assessment and management. If AMP clinical assessment determines coal mine worker is at high risk for acute decompensation, refer to ED for acute assessment. Coal mine worker to remain temporarily unfit until AMP reviews medical information provided by the GP confirming results of the assessment and adequacy of management. Follow-up If diabetes is diagnosed, refer to the relevant medical management table within this Standard. If diabetes is not diagnosed, review as per any comorbidities.	Management Certify as temporarily unfit for work and refer to GP for further assessment and management. If AMP clinical assessment determines coal mine worker is at high risk for acute decompensation, refer to ED for acute assessment. Coal mine worker to remain temporarily unfit until AMP reviews medical information provided by the GP confirming results of the assessment and adequacy of management. Follow-up If diabetes is diagnosed, refer to the relevant medical management table within this Standard. If diabetes is not diagnosed, review as per any comorbidities.	Management Certify as temporarily unfit for work and refer to GP for further assessment and management. If AMP clinical assessment determines coal mine worker is at high risk for acute decompensation, refer to ED for acute assessment. Coal mine worker to remain temporarily unfit until AMP reviews medical information provided by the GP confirming results of the assessment and adequacy of management. Follow-up If diabetes is diagnosed, refer to the relevant medical management table within this Standard. If diabetes is not diagnosed, review as per any comorbidities.
Random BGL of ≥ 20 mmol/L (regardless of history of diabetes or presence of	Management Certify as temporarily unfit for work and refer to GP for further assessment and	Management Certify as temporarily unfit for work and refer to GP for further assessment and	Management Certify as temporarily unfit for work and refer to GP for further assessment and

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
glycosuria) OR HbA1c of >10%	management. AMP to also organise immediate assessment due to high risk for acute decompensation by referring the worker to the ED or their GP. The coal mine worker is to remain temporarily unfit for work until the AMP receives information back from the treating doctor confirming results of the assessment and adequacy of management. If diabetes is diagnosed, refer to the relevant medical management table within this Standard Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	management. AMP to also organise immediate assessment due to high risk for acute decompensation by referring the worker to the ED or their GP. The coal mine worker is to remain temporarily unfit for work until the AMP receives information back from the treating doctor confirming results of the assessment and adequacy of management. If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.	management. AMP to also organise immediate assessment due to high risk for acute decompensation by referring the worker to the ED or their GP. The coal mine worker is to remain temporarily unfit for work until the AMP receives information back from the treating doctor confirming results of the assessment and adequacy of management. If diabetes is diagnosed, refer to the relevant medical management table within this Standard. Follow-up If diabetes is diagnosed, see relevant medical management tables within this Standard to guide follow up requirements. If diabetes is not diagnosed, review as per any comorbidities.

Table 3: Diabetes management

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Diabetes	Confirmation of a diagnosis of diabetes should be obtained from the coal mine worker's GP or treating specialist. This includes any self-reported history of diabetes. The following information should be requested by the AMP to ensure an appropriate health certification is made: • Diabetes diagnosis and treatment plan, including list of current diabetes medications and any requirement for an insulin pump and/or continuous glucose monitor or flash glucose monitor. • Compliance with treatment • Evidence of diabetes control, including the coal mine workers most recent HbA1c result (preferably within past 3 months)* • History of hypoglycaemic episodes and awareness of hypoglycaemia symptoms (if relevant) • Any end organ damage If a recent HbA1c is unavailable at the time of the Order 45 assessment the AMP will need to request provision from the treating doctor within 6 months to determine the appropriate management and follow-up interval. Satisfactory diabetes control is defined by this standard as: • a HbA1c of less than 9%*; and • Evidence of regular monitoring; and • Compliance with prescribed medication; and • Absence of end-organ effects likely to affect work safety *In this Standard, satisfactory diabetes control refers to a HbA1c of <9.0% which is for occupational purposes to allow for the coal mine worker to continue working while treatment is optimised. If the HbA1c is >9% but less than 10% the worker should be referred to their GP to review their diabetic management and earlier review period recommended. If the HbA1c is greater than 10%, Category A and Category B coal mine workers should be certified as temporarily unfit for work, and referred to their GP for further assessment, as there is a greater risk of hospitalisation with intercurrent illness at this level. Within the 'Treated by diet and exercise alone' category in this table a HbA1c of < 6.5% is used to indicate optimal diabetes control as this level is below the diagnostic threshold for diabetes.		
Type 2 Diabetes Treated by diet and exercise alone* *Where optimal control is indicated by an HbA1c of <6.5% If the HbA1c does not indicate	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.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
adequate diabetes control with diet and exercise alone the AMP should consider referring the worker to their GP for further assessment and optimisation of their diabetes control. Earlier review for Category A and Category B workers may be required in this circumstance.			
Type 2 Diabetes Treated by diet, exercise and metformin or metformin and a gliptin, SGLT2 inhibitor or GLP-1 receptor agonist. AND HbA1c of <7.5%* AND no significant proteinuria or end-organ effects. *If a recent HbA1c is unavailable at the time of the Order 45 assessment the AMP will need to request provision from the treating doctor within 6 months to determine the appropriate follow-up interval.	Management Certify as fit for work. AMP to refer coal mine worker to their GP for management of any risk factors. Follow-up Review of medical information provided by GP at 12 months. Ongoing review frequency to then be determined by level of diabetes control, medications required and the presence of complications as outlined within the relevant sections of this table.	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.
Type 2 Diabetes Treated by diet, exercise and metformin or metformin and a gliptin, SGLT2 inhibitors or GLP-1 receptor agonists. AND HbA1c of $\geq 7.5\%$* but <10%	Management Certify as fit for work. AMP to refer coal mine worker to their GP for further assessment and management of any risk factors. Follow-up	Management Certify as fit for work. AMP to refer coal mine worker to their GP for further assessment and management of any risk factors. Follow-up	Management Certify as fit for work. AMP to make duty of care referral to GP for further assessment and management. Follow-up Routine review.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
AND/OR glycosuria or proteinuria or end-organ effects *If an HbA1c is unavailable at the time of assessment the AMP will need to request provision from the treating doctor within 6 months to determine the appropriate follow-up interval.	Review of medical information provided by GP at 12 months. Ongoing review frequency to then be determined by level of diabetes control, medications required and the presence of complications as outlined within the relevant sections of this table.	Review of medical information provided by GP at 12 months. Ongoing review frequency to then be determined by level of diabetes control, medications required and the presence of complications as outlined within the relevant sections of this table.	
Type 2 Diabetes Treated with glucose-lowering agents other than insulin, which may cause hypoglycaemia This includes sulfonylureas and meglitinides.	Management For an initial health assessment for the role, evidence of satisfactory diabetes control must be obtained prior to certifying as fit for work. The coal mine worker can be certified as fit for work if information is provided by the GP or treating doctor that the following criteria are met: • The diabetes is satisfactory controlled, and the coal mine worker is compliant with treatment; and • There is no history of a recent severe hypoglycaemic event as assessed by the treating doctor; and • The coal mine worker always has early warning symptoms when their blood glucose level is low; and • The coal mine worker is following a treatment regime that minimises the risk of hypoglycaemia; and • There is absence of end-organ effects that may affect work safety	Management For an initial health assessment for the role, evidence of satisfactory diabetes control must be obtained prior to certifying as fit for work. The coal mine worker can be certified as fit for work if information is provided by the GP or treating doctor that the following criteria are met: • The diabetes is satisfactory controlled, and the coal mine worker is compliant with treatment; and • There is no history of a recent severe hypoglycaemic event as assessed by the treating doctor; and • The coal mine worker always has early warning symptoms when their blood glucose level is low; and • The coal mine worker is following a treatment regime that minimises the risk of hypoglycaemia; and • There is absence of end-organ effects that may affect work safety	Management Certify as fit for work. AMP to make duty of care referral to GP for management of diabetes and any risk factors. Follow-up Routine review.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	Additional Certification requirements <i>All coal mine workers (surface and underground roles)</i> The AMP must add these comments to the health assessment certificate advising of these requirements and the need for the PCBU to include these in a health management plan. • must carry glucose and be able to measure their blood glucose in the workplace. <i>Underground workers – additional requirements</i> For underground workers, the AMP must also add the following additional requirements to the coal mine workers health assessment certificate and highlight the need for the PCBU to include these in a health management plan: • A designated crew member must be aware of their condition • Must not work alone without an approved medical management plan Follow-up Annual review of medical information provided by the GP or treating doctor confirming ongoing adequate diabetes control. If no medical information is provided to the AMP, then the coal mine worker's health assessment certificate will expire.	Additional Certification requirements <i>All coal mine workers (surface and underground roles)</i> The AMP must add these comments to the health assessment certificate advising of these requirements and the need for the PCBU to include these in a health management plan. • must carry glucose and be able to measure their blood glucose in the workplace. <i>Underground workers – additional requirements</i> For underground workers, the AMP must also add the following additional requirements to the coal mine workers health assessment certificate and highlight the need for the PCBU to include these in a health management plan: • A designated crew member must be aware of their condition • Must not work alone without an approved medical management plan Follow-up Annual review of medical information provided by the GP or treating doctor confirming ongoing adequate diabetes control. If no medical information is provided to the AMP, then the coal mine worker's health assessment certificate will expire.	

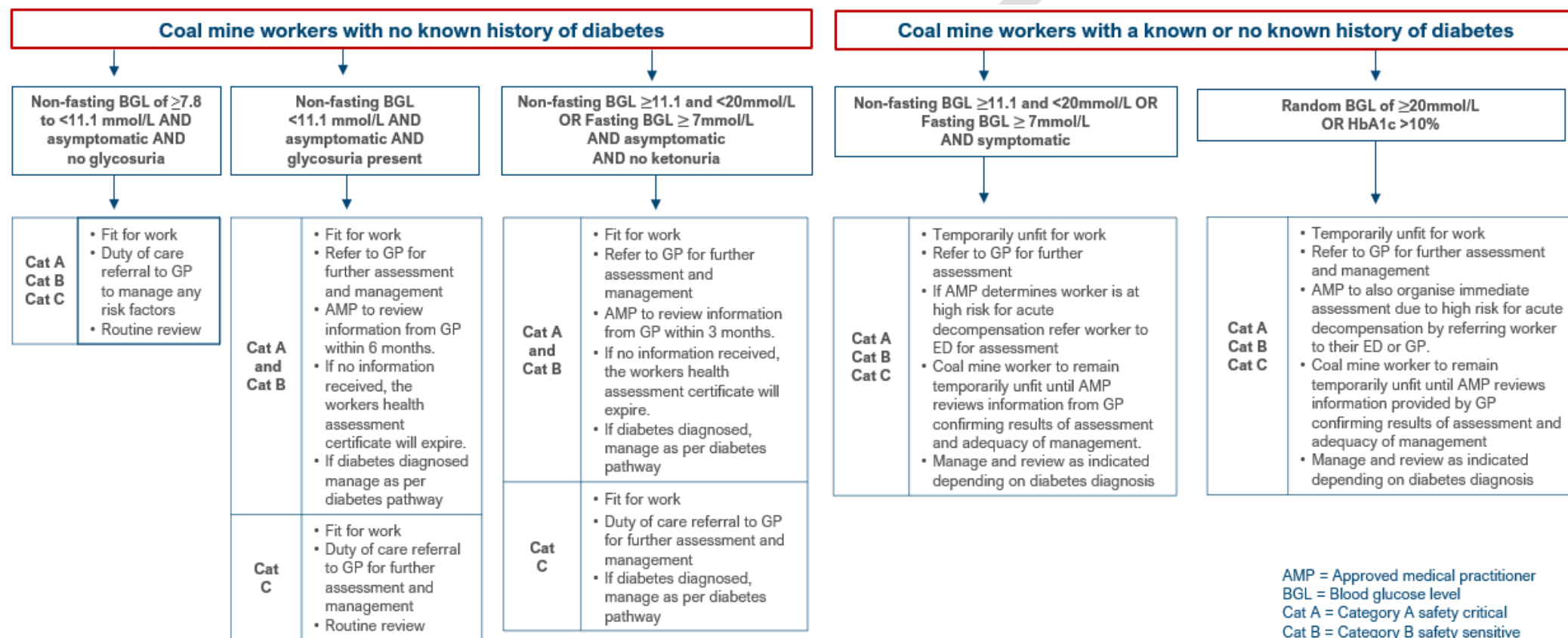
Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
Insulin treated diabetes* *Includes workers with Type 1 or Type 2 diabetes treated by insulin.	Coal mine workers with Type 1 or Type 2 diabetes treated by insulin or other medication that pose a hypoglycaemic risk must have access to glucose and a reliable method of monitoring blood glucose levels during their shift. Insulin-treated individuals are generally not considered suitable for isolated or remote work duties, without suitable controls. The underground setting presents additional challenges, limitations with use of electronic equipment, and limited access to emergency support. Coal mine workers with diabetes in these roles must have appropriate glycaemic control and good hypoglycaemic awareness. When there is risk of hypoglycaemic episodes, controls include: • ensuring team awareness of the condition • ready access to glucose for treatment • approved underground-compatible continuous glucose monitors (CGM), and insulin pumps* • avoidance of extended solo work. *These electronic devices require a risk assessment and approval by the mine operator prior to use. Use of electronic diabetes devices such as CGMs, flash glucose monitors and insulin pumps in underground coal mines is governed by safety regulations due to potential risk of explosion in hazardous areas. Suitability for use of electronic diabetes devices should be determined on an individual basis. The coal mine workers treating doctor should be informed about the nature of their work, so they provide an informed assessment of whether the electronic device is clinically necessary for the coal mine worker's diabetes management. Or, where potential workplace restrictions are required, whether adequate diabetes control and safety could be achieved using an alternative, non-electronic management approach. Insulin treated diabetes is also subject to requirements under the Australian fitness to drive standards (Assessing fitness to drive 2022) which include consideration of the history of severe hypoglycaemic events, hypoglycaemia awareness and treatment plans that minimise the risk of hypoglycaemia. Requirements are subject to ongoing review by the driver licensing authority based on information provided by the treating doctor regarding adequacy and stability of diabetes control.		
Insulin treated diabetes	Management Evidence of satisfactory diabetes control must be obtained prior to certifying as fit for work for coal mine workers who are: - new to industry OR - an existing worker having a health assessment for a new position OR - an existing worker having a health assessment with a new employer. The coal mine worker can be certified as fit for work if information is provided by the treating specialist that the following criteria are met:	Management Evidence of satisfactory diabetes control must be obtained prior to certifying as fit for work for coal mine workers who are: - new to industry OR - an existing worker having a health assessment for a new position OR - an existing worker having a health assessment with a new employer. The coal mine worker can be certified as fit for work if information is provided by the treating specialist or GP* that the following criteria are met:	Management For an initial health assessment for the role, evidence of satisfactory control must be obtained from the GP prior to certifying as fit for work. For subsequent health assessments: Certify as fit for work AMP to refer coal mine worker to GP for management of any risk factors.

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	- The diabetes is satisfactory controlled (as evidenced by current HbA1c), and the coal mine worker is compliant with treatment; and - There is no history of a recent severe hypoglycaemic event as assessed by the specialist; and - The coal mine worker always has early warning symptoms when their blood glucose level is low; and - The coal mine worker is following a treatment regime that minimises the risk of hypoglycaemia; and - There is absence of end-organ effects that may affect work safety For existing employees, who have commenced insulin treatment since their previous health assessment, this information is required within 3 months of the health assessment, or the coal mine workers health certificate will expire. Additional Certification requirements <i>All coal mine workers (surface and underground roles)</i> The AMP must add these comments to the health assessment certificate advising of these requirements and the need for the PCBU to include these in a health management plan.	- The diabetes is satisfactory controlled (as evidenced by current HbA1c), and the coal mine worker is compliant with treatment; and - There is no history of a recent severe hypoglycaemic event as assessed by the specialist; and - The coal mine worker always has early warning symptoms when their blood glucose level is low; and - The coal mine worker is following a treatment regime that minimises the risk of hypoglycaemia; and - There is absence of end-organ effects that may affect work safety *A specialist report required for Type 1 diabetes. A specialist or GP report can be provided for coal mine workers with Type 2 diabetes treated by insulin. For existing employees, who have commenced insulin treatment since their previous health assessment, this information is required within 3 months of the health assessment, or the coal mine workers health certificate will expire. Additional Certification requirements <i>All coal mine workers (surface and underground roles)</i> The AMP must add these comments to the health assessment certificate advising of these requirements and the need for the PCBU to include these in a health management plan.	Follow-up Routine review

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
	• must carry glucose and be able to measure their blood glucose in the workplace. • Must ensure that all electronic devices used to measure blood glucose levels or deliver insulin are risk assessed and approved for use in the relevant work setting. <i>Underground workers – additional requirements</i> For underground workers, the AMP must also add the following additional requirements to the coal mine workers health assessment certificate and highlight the need for the PCBU to include these in a health management plan: • A designated crew member must be aware of their condition • Must not work alone without an approved medical management plan Follow-up Annual review of medical information provided by the treating specialist confirming ongoing adequate diabetes control. If no medical information is provided to the AMP, then the coal mine worker's health assessment certificate will expire.	• must carry glucose and be able to measure their blood glucose in the workplace. • Must ensure that all electronic devices used to measure blood glucose levels or deliver insulin are risk assessed and approved for use in the relevant work setting. <i>Underground workers – additional requirements</i> For underground workers, the AMP must also add the following additional requirements to the coal mine workers health assessment certificate and highlight the need for the PCBU to include these in a health management plan: • A designated crew member must be aware of their condition • Must not work alone without an approved medical management plan Follow-up Annual review of medical information provided by the treating specialist or GP* confirming ongoing adequate diabetes control. If no medical information is provided to the AMP, then the coal mine worker's health assessment certificate will expire. *A specialist report required for Type 1 diabetes. A specialist or GP report can be	

Condition	Coal mine worker Category A: Safety critical	Coal mine worker Category B: Safety sensitive	Coal mine worker Category C: Non-safety sensitive
		provided for coal mine workers with Type 2 diabetes treated by insulin.	
Severe hypoglycaemic event	A severe hypoglycaemic event' is defined as an event of hypoglycaemia of sufficient severity such that the person is unable to treat the hypoglycaemia themselves and requires another person/s to assist with or administer treatment. It includes hypoglycaemia causing loss of consciousness. Any severe hypoglycaemic event whether it occurs during work time or outside of work hours is relevant to the assessment in relation to this Standard. If an occurrence of a severe hypoglycaemic event is identified during an Order 45 health assessment (self-reported by the coal mine worker) the AMP should certify the coal mine worker as temporarily unfit for work until their diabetes is reassessed by their treating doctor and they provide confirmation that the diabetes is under satisfactory control. Where the AMP considers the coal mine worker unfit for the designated Category A or Category B position, they should discuss with the PCBU, with consent from the coal mine worker, whether they would be suitable for other non-safety critical or non-safety sensitive duties. This should occur following the coal mine worker's consent and before the health certification is finalised. If the occurrence of a severe hypoglycaemic event is identified outside of the Order 45 health assessment process this should trigger a fitness for work assessment. Further guidance relating to fitness for work assessments can be found in appendix A. A severe hypoglycaemic event may also trigger requirements under Australian fitness to drive standards (Assessing fitness to drive 2022), including minimum non-driving periods and medical clearance before returning to driving.		
Severe hypoglycaemic event	Management If the severe hypoglycaemic event is self-reported or the subject of a fitness for work assessment, the coal mine worker should be certified as temporarily unfit for work until a specific assessment by the treating specialist has been completed. The coal mine worker should remain unfit for work for generally at least 6 weeks after the severe hypoglycaemic episode. AMP to certify as fit for work once information received from the treating specialist confirming satisfactory control. Follow-up Once certified as fit for work, review as per usual follow up for the condition.	Management If the severe hypoglycaemic event is self-reported or the subject of a fitness for work assessment, the coal mine worker should be certified as temporarily unfit for work until a specific assessment by the treating specialist has been completed. The coal mine worker should remain unfit for work for generally at least 6 weeks after the severe hypoglycaemic episode. AMP to certify as fit for work once information received from the treating specialist confirming satisfactory control. Follow-up Once certified as fit for work, review as per usual follow up for the condition.	Management If the severe hypoglycaemic event is self-reported or the subject of a fitness for work assessment, the coal mine worker should not be certified as fit for work until evidence of satisfactory control is obtained from the GP or treating doctor. Follow-up Routine review

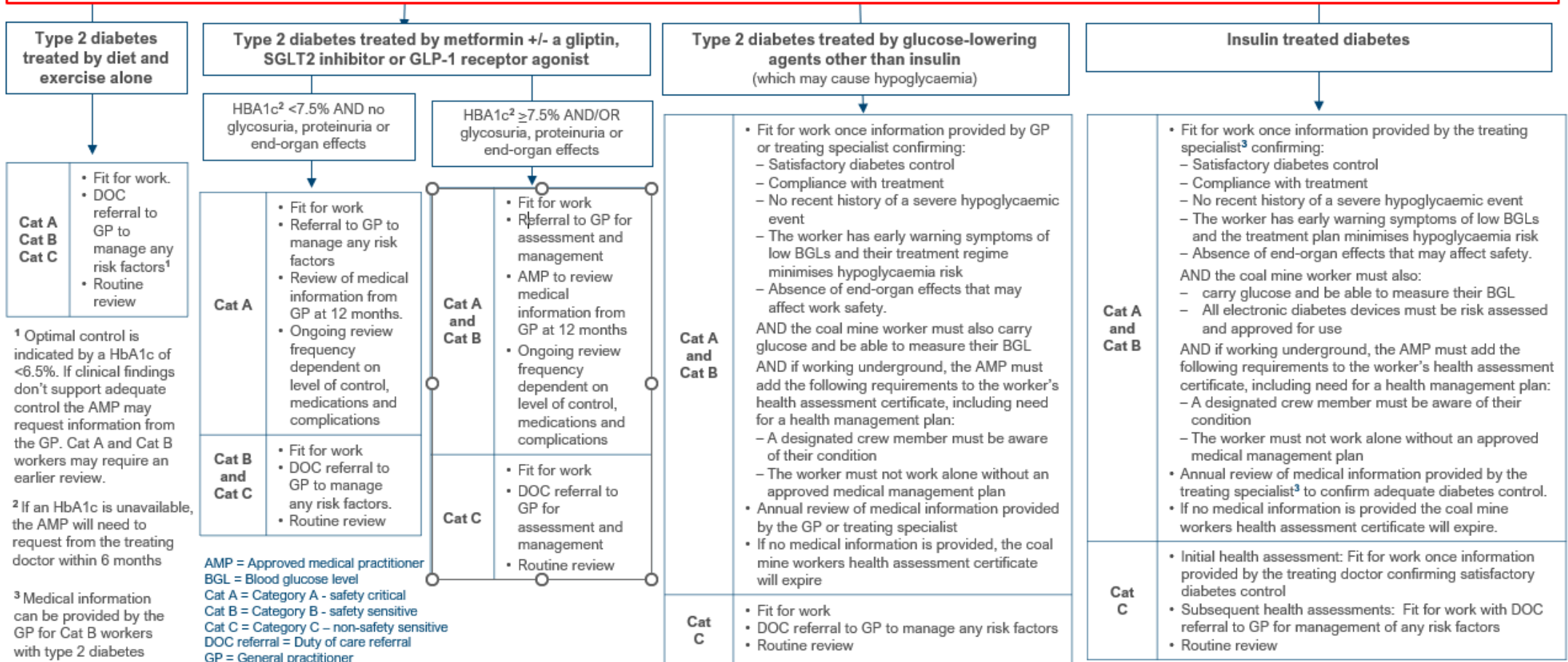
Diabetes screening and risk assessment pathway



AMP = Approved medical practitioner
 BGL = Blood glucose level
 Cat A = Category A safety critical
 Cat B = Category B safety sensitive
 Cat C = Category C non-safety sensitive
 ED = emergency department
 GP = General practitioner

Diabetes management pathway

Coal mine workers with a confirmed history of diabetes



¹ Optimal control is indicated by a HbA1c of <6.5%. If clinical findings don't support adequate control the AMP may request information from the GP. Cat A and Cat B workers may require an earlier review.

² If an HbA1c is unavailable, the AMP will need to request from the treating doctor within 6 months

³ Medical information can be provided by the GP for Cat B workers with type 2 diabetes treated by insulin.

Considerations before certifying fitness for work

When assessing coal mine workers with diabetes, a health assessment of their fitness for work must consider whether they have the capacity to start or continue in a position with or without restrictions, and whether there are any foreseeable health and safety risks 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 determining whether diabetes is satisfactorily controlled. Evidence showing that the coal mine worker with a history of diabetes is adequately monitored, with good control of any relevant risk factors, may allow a coal mine worker to be certified as 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 treating specialist.

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 the coal mine worker's diabetes was to lead to unavoidable incapacity
- does the coal mine worker require an electronic diabetes device? Can the device be used within the work environment?
- the overall severity of the diabetes and any comorbidities, if any, on the coal mine worker's health
- the duration and stability of the diabetes
- the degree of abnormality of any result
- 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
 - The condition may need to be fully investigated to determine whether the coal mine worker is fit for the position.
- If diabetes 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 A: Fitness for Work Assessments

Employers may request a dedicated fitness for work assessment where there are concerns a coal mine worker's diabetes is impacting their fitness for work. This may be due to concerns relating to inadequate diabetes control or management, resulting in potential health and safety risks for the coal mine worker and/or others in the workplace.

Circumstances that may prompt a fitness for work assessment include:

- A severe hypoglycaemic event
- Recurrent symptoms suggestive of hypoglycaemia or hyperglycaemia, that may be impairing alertness, concentration, judgement, coordination or decision making
- An incident or near miss in the workplace where diabetes may have been a contributing factor.

If a fitness for work assessment is requested, the PCBU should provide objective supporting information, where available including:

- incident or near-miss incident reports
- records of first aid, emergency medical response, or treatment including any relevant blood glucose readings.
- Documented observations or witness reports describing symptoms or behaviours suggestive of hypoglycaemia or hyperglycaemia
- details of worker's usual duties or tasks relevant to the concern.

During the fitness for work assessment, the Order 45 approved medical practitioner and/or occupational and environmental physician should undertake a comprehensive assessment to determine whether diabetes and/or other factors may have contributed to the reported episode or concerns.

Appendix B: Clarke Hypoglycaemia Awareness Questionnaire

CLARKE HYPOGLYCAEMIA AWARENESS QUESTIONNAIRE

1. Choose the category that best describes you: (check one only)

- ☐ I always have symptoms when my blood sugar is low (A)
☐ I sometimes have symptoms when my blood sugar is low (R)
☐ I no longer have symptoms when my blood sugar is low (R)

2. Have you lost some of the symptoms that used to occur when your blood sugar was low?

- ☐ Yes (R) ☐ No (A)

3. In the past six months how often have you had moderate hypoglycaemia episodes?
(episodes where you might feel confused, disorientated, or lethargic and were unable to treat yourself)

- ☐ Never (A) ☐ Every other month (R) ☐ More than once a month (R)
☐ Once or twice (R) ☐ Once a month (R)

4. In the past year how often have you had severe hypoglycaemia episodes?
(episodes where you were unconscious or had a seizure and needed glucagon or intravenous glucose)

- ☐ Never (A) ☐ 4 to 7 times (R) ☐ 12 times or more (U)
☐ 1 to 3 times (R) ☐ 8 to 11 times (R)

5. How often in the last month have you had readings of less than 3.8 mmol/L with symptoms?

- ☐ Never ☐ 1 time / week ☐ 4-5 times / week
☐ 1 to 3 times ☐ 2-3 times / week ☐ Almost daily

(Score R if the answer to Q5 is less than the answer to Q6; score A if the answer to Q5 is greater than or equal to the answer to Q6)

6. How often in the last month have you had readings of less than 3.8 mmol/L without any symptoms?

- ☐ Never ☐ 1 time / week ☐ 4-5 times / week
☐ 1 to 3 times ☐ 2-3 times / week ☐ Almost daily

(Score R if the answer to Q5 is less than the answer to Q6; score A if the answer to Q5 is greater than or equal to the answer to Q6)

7. How low does your blood sugar need to go before you feel symptoms?

- ☐ 3.3-3.8 mmol/L (A) ☐ 2.2-2.7 mmol/L (R)
☐ 2.7-3.3 mmol/L (A) ☐ Less than 2.2 mmol/L (R)

8. To what extent can you tell by your symptoms that your blood sugar is low?

- ☐ Never (R) ☐ Often (A) ☐ Rarely (R)
☐ Always (A) ☐ Sometimes (R)

SCORES: U= A= R=

Appendix C: Use of electronic diabetes device in the NSW coal industry

The use of insulin pumps and continuous glucose monitoring (CGM) sensors in underground coal mines introduces specific safety considerations due to the presence of methane and coal dust, which create hazardous (potentially explosive) atmospheres. These medical devices are typically battery-powered electronic equipment worn on the body and therefore may present an ignition risk if not appropriately designed or assessed. In hazardous mining environments, any electronic device carried underground must be evaluated against intrinsic safety principles, ensuring that it cannot generate sufficient heat or sparks to ignite a flammable atmosphere. Intrinsically safe equipment achieves this by limiting electrical and thermal energy, a key requirement in industries where explosion risk exists.

[Section 81 of the Work Health and Safety \(Mines and Petroleum Sites\) Regulation 2022 \(NSW\)](#) specifically requires that all plant used in a hazardous zone of an underground coal mine must be explosion-protected, and if electrical, must meet an appropriate explosion-protection level such as Ex ia (intrinsic safety) or equivalent certified protection methods. This requirement is broad and applies to any “plant,” which may include wearable electronic devices if they are deemed to introduce risk. Therefore, standard consumer insulin pumps and CGM sensors unless certified to recognised explosion-protection standards e.g. IECEx, would generally not comply for unrestricted use in hazardous zones. Approval may require engineering assessment, procedural controls, or restrictions e.g. exclusion from certain zones.

Although [Section 82 of the Work Health and Safety \(Mines and Petroleum Sites\) Regulation 2022 \(NSW\)](#) further supports these provisions (generally addressing controls and management of plant and equipment in hazardous zones), the overarching intent of both sections is to ensure that no ignition source is introduced into classified areas without formal verification, certification, or risk control measures. In practice, this means that mine operators must assess electronic diabetic devices on a case-by-case basis, balancing worker health needs with explosion risk. Controls may include documented risk assessments, limiting use to lower-risk zones, or requiring intrinsically safe certification where available. Ultimately, while insulin pumps and CGM sensors are critical for worker health, their use underground must align strictly with hazardous area equipment requirements under sections 81 and 82 to ensure compliance and prevent catastrophic ignition events.

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