CS Health

Information for employers

NSW Coal Mining Industry Respiratory Health Standard

August 2024

Introduction

Coal mining produces coal dust and dusts from other minerals, including silica. Repeated exposure to coal mine dust can put coal mine workers at risk of developing coal mine dust lung diseases (CMDLD).

CMDLD includes not only the “classic” pneumoconioses of coal workers’ pneumoconiosis (CWP), mixed dust pneumoconiosis, and silicosis, but also obstructive lung diseases including emphysema and chronic bronchitis; lung function decline; and pulmonary fibrosis, known as dust-related diffuse fibrosis.

It is well established that the early detection of disease can allow for better treatment options and improved health outcomes. Therefore, detecting, identifying, and diagnosing any potential coal mine dust lung disease as early as possible is important to protect against further damage to the lungs.

Since the re-identification of black lung in Queensland in 2015, there have been significant developments in the medical standards relating to how these conditions are identified and managed.

Guidance notes issued by the Thoracic Society of Australia and New Zealand (TSANZ), National Dust Disease Taskforce, Workers’ Compensation Regulatory Services Queensland, Resources Safety and Health Queensland, and most recently, the Review of the NSW Health Surveillance Scheme for Coal Mine Workers, have further informed these practices.

Respiratory Health Standard

The NSW Coal Mining Industry Respiratory Health Standard is the first of a series of health standards to be developed specifically for the NSW coal mining industry.

The Respiratory Health Standard draws on current best practices to support approved medical practitioners to make consistent, evidence-based clinical decisions regarding respiratory health. It instructs them on which respiratory investigations to arrange when assessing the health of a coal mine worker's lungs and provides clear clinical pathways and protocols for managing respiratory impairment.

The Respiratory Health Standard has been developed by the Coal Services Standing Health Committee, in conjunction with the Coal Services MSAC Review Implementation Working Group, other industry stakeholders and relevant medical specialists. It has been endorsed by the Coal Services Clinical Governance Committee and an independent Occupational and Environmental Physician.

This information pack includes:

- An overview of the Guidelines contained in the Respiratory Health Standard
- Working examples of the guidelines in application
- Details of further resource materials

Background

In 2021, the NSW Government (Department of Regional NSW) commissioned an independent quality assurance review of the NSW Health Surveillance Scheme for Coal Mine Workers (the Review). The University of Illinois School of Public Health (Chicago) was selected through an open tender process to conduct the Review.

The Review was a recommendation of, and overseen by, the NSW Mine Safety Advisory Council (MSAC).

A report was handed down to the NSW Resources Regulator on 20 February 2023 and shared publicly on 1 September 2023. The full report is available on the NSW Resources Regulator's website.

The Review found that CS Health has a robust system for medical health surveillance of coal mine workers in NSW, noting that considerable improvements have been made to the scheme since the re-identification of black lung disease in Australia in 2015.

The report detailed 16 recommendations to further strengthen the health surveillance of coal mine workers and to provide enhanced health protection. These recommendations were unanimously accepted by MSAC, with Coal Services (through CS Health), being tasked to implement the recommendations.

There are two recommendations that are of particular importance to industry:

- **Recommendation 2** which advised that CS Health should develop clear, formal guidelines for the management of abnormal findings on spirometry and chest x-ray; and
- **Recommendation 14** which advised that CS Health establish formal criteria to return workers with early coal mine dust lung disease (CMDLD) and/or other non-occupational lung diseases to work, and for those with more advance lung disease removal from dust exposure altogether.

In recent years, there have been significant advancements in medical standards regarding the identification and management of respiratory conditions, incorporating new testing requirements to screening processes/ or procedures.

Based on these standards and testing requirements, the Review provided direction to

CS Health on what should occur when lung abnormalities are identified. That is, when a certain degree of lung impairment is identified,

> ***"Regardless of the putative underlying cause(s) of a worker's lung disease, the severity of lung function abnormalities should, by themselves, prompt consideration for reducing future dust exposure."***

To address Recommendation 2 and 14 respectively, CS Health has developed:

- Clinical pathways for coal mine dust lung disease monitoring
- Guidelines for managing identified lung disease in the coal mining environment

These documents (which form part of the NSW Coal Mining Industry Respiratory Health Standard) have been developed to provide a consistent methodology for approved medical practitioners when performing Order 43 health assessments on NSW coal mine workers.

Guidelines for managing identified lung disease in the coal mining industry

The Review recommended that coal mine workers with increasing respiratory function impairment should have reduced ongoing potential coal mine dust exposure, to preserve their respiratory function and quality of life.

Therefore, health assessments must also consider the coal mine worker's current capacity to perform their role and the preservation of their remaining lung function once a certain level of lung impairment is confirmed.

The Guidelines for managing identified lung disease in the coal mining environment (the guidelines) were developed for Order 43 approved medical practitioners to establish a consistent methodology for managing coal mine workers who have abnormal chest x-rays or spirometry results, or show a serial decline in spirometry.

These guidelines aim to facilitate either the safe return of affected coal mine workers to their roles or protect them from further exposure to coal mine dust in the workplace.

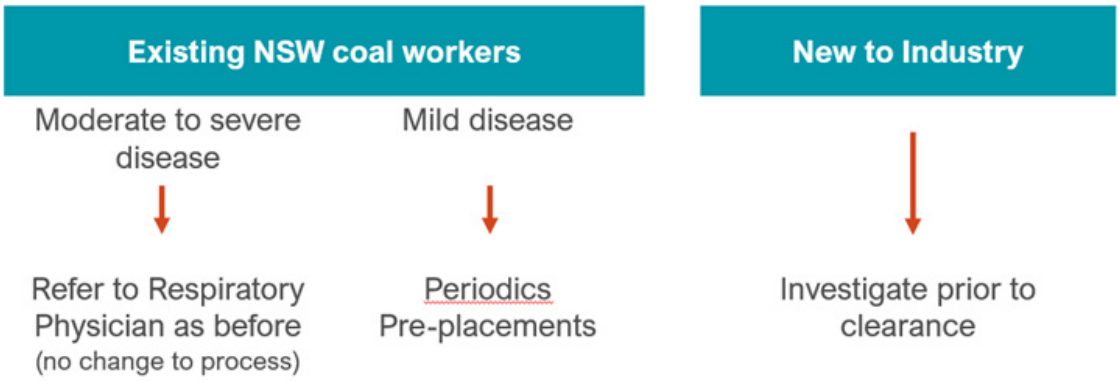
The guidelines consider:

- Workplace occupational dust exposures
- Enhanced medical surveillance
- Exposure guidelines
- Radiological abnormalities.

New entrants to the NSW coal industry with identified respiratory abnormalities must undergo investigations before a health assessment determination can be completed. If a respiratory health diagnosis is confirmed, they may be subject to dust exposure restrictions on their medical assessment certificates.

Existing coal mine workers identified with respiratory abnormalities will be managed as per the clinical pathways in the Respiratory Health Standard and may be subject to dust exposure restrictions on their medical assessment certificates.

Diagram 1: The guidelines in application



Clinical pathways for respiratory conditions

As part of the Order 43 health assessment, coal mine workers are assessed by Order 43 approved medical practitioners for any signs of respiratory impairment.

These health examinations include:

- Chest x-ray
- Spirometry
- Clinical findings and symptoms

Further investigations may be warranted where the results from the above examinations could indicate CMDLD. Coal mine dust can affect individuals differently, making it important to have different clinical pathways to check for respiratory damage.

Pathway 1: Respiratory conditions detected on a chest x-ray

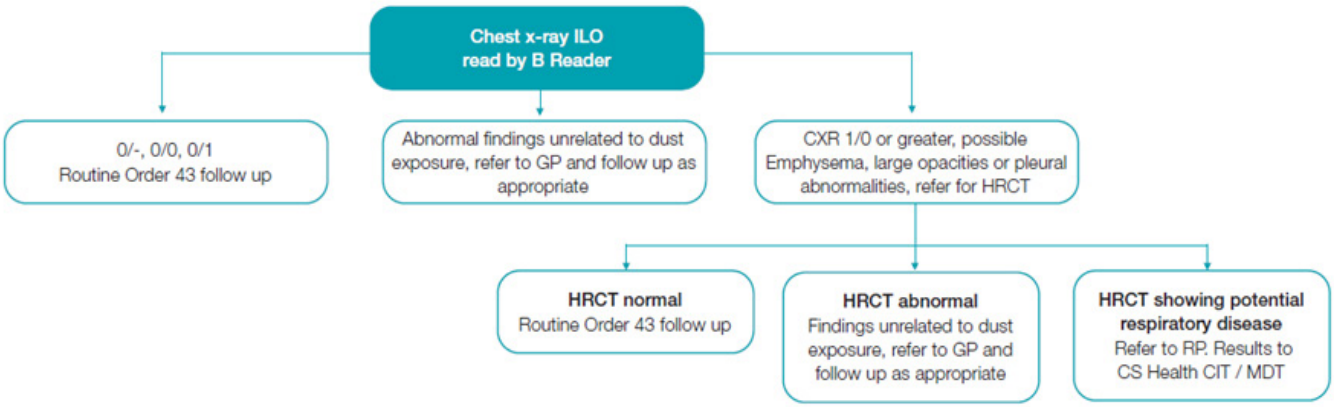
In some cases, respiratory damage may appear as scarring in the respiratory tract, which is identified on the chest x-ray. However, early disease can be difficult to see clearly on a chest x-rays so a coal mine worker will be referred for a high-resolution computerised tomography scan (HRCT).

An HRCT can clarify whether there are respiratory abnormalities that require further investigation.

Abnormalities can sometimes be detected that are not related to coal mine dust exposure and do not impact a coal mine worker's ability to work safely. These cases can be followed up by the coal mine worker's GP or treating doctor. Where a non-occupational impairment/condition is detected that impacts a coal mine worker's safety, this may attract a restriction, but the underlying abnormality would still be managed by their GP or treating doctor.

When respiratory abnormalities are identified, a referral to a respiratory physician is organised by CS Health.

Diagram 2: Chest x-ray pathway



Pathway 2: Respiratory conditions detected via spirometry and/or clinical symptoms

This clinical pathway involves the Order 43 approved medical practitioner looking for changes in spirometry and/or symptoms. For example, has the airflow changed on their spirometry? Has the coal mine worker developed a cough, phlegm, or shortness of breath that was not there before?

An Order 43 approved medical practitioner must complete a specific course in spirometry interpretation to ensure accurate interpretation specifically monitoring for any changes in lung function over time.

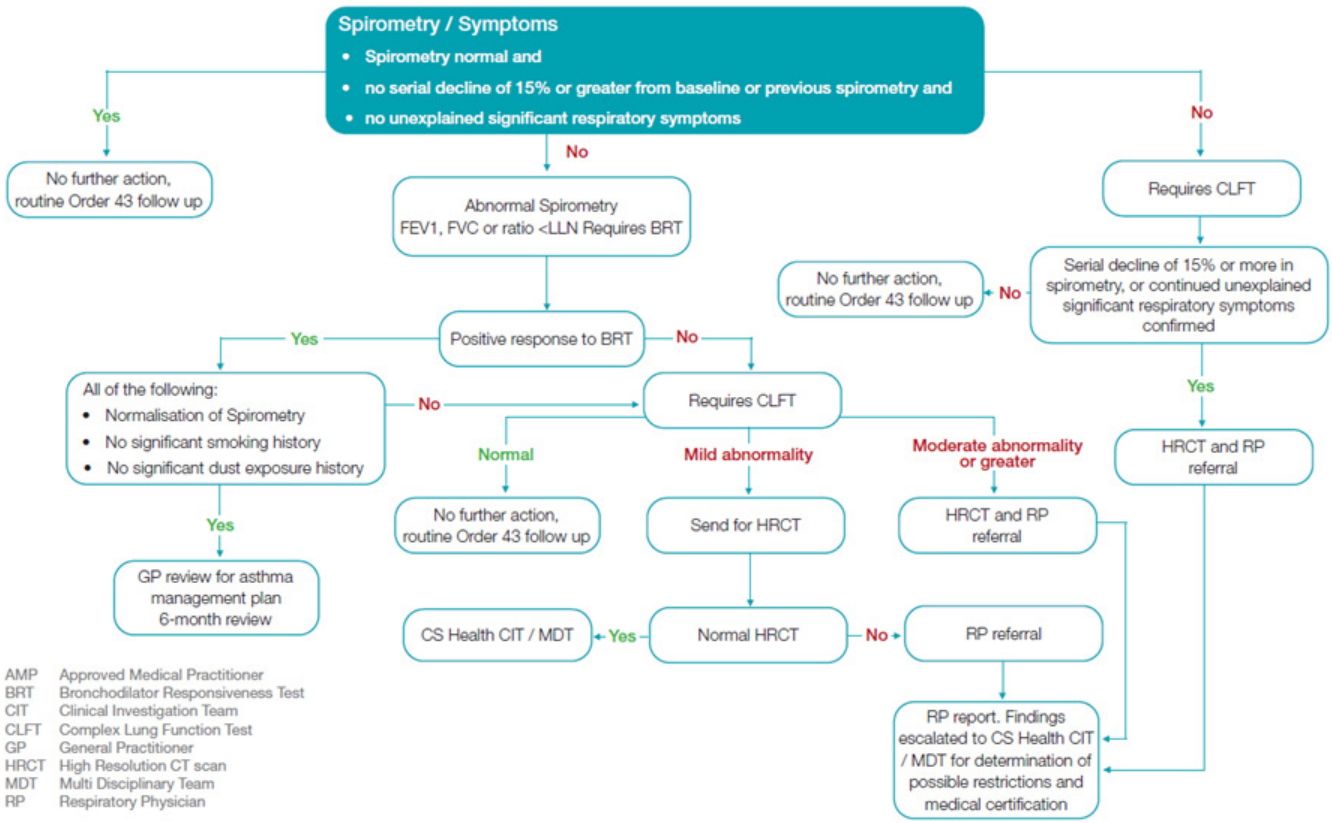
An unexplained change in spirometry or symptoms will lead to a complex lung function test (CLFT) to measure for damage to the gas exchange areas in addition to flow rates and volumes.

If a mild impairment of respiratory function is identified, the coal mine worker will be referred for a HRCT scan to investigate for undetected early respiratory damage. If the HRCT scan result is 'normal', the coal mine worker can be managed according to the respiratory function test findings.

Respiratory function abnormalities greater than mild will trigger a referral for a HRCT scan and a clinical review by a respiratory physician. The results from all the investigations are then reviewed by CS Health's Clinical Investigation Team (CIT) to determine ongoing medical management and health assessment review.

On occasion, the outcome of the clinical investigation remains uncertain. Many respiratory conditions can look similar, and only a biopsy may be able to clarify the exact diagnosis. This procedure is not without risk and is often not considered appropriate when the person is otherwise well and asymptomatic. These cases can be referred to an independent multidisciplinary team consisting of a radiologist, respiratory physician, and occupational physician for further opinion.

Diagram 3: Spirometry/symptoms pathways



Examples

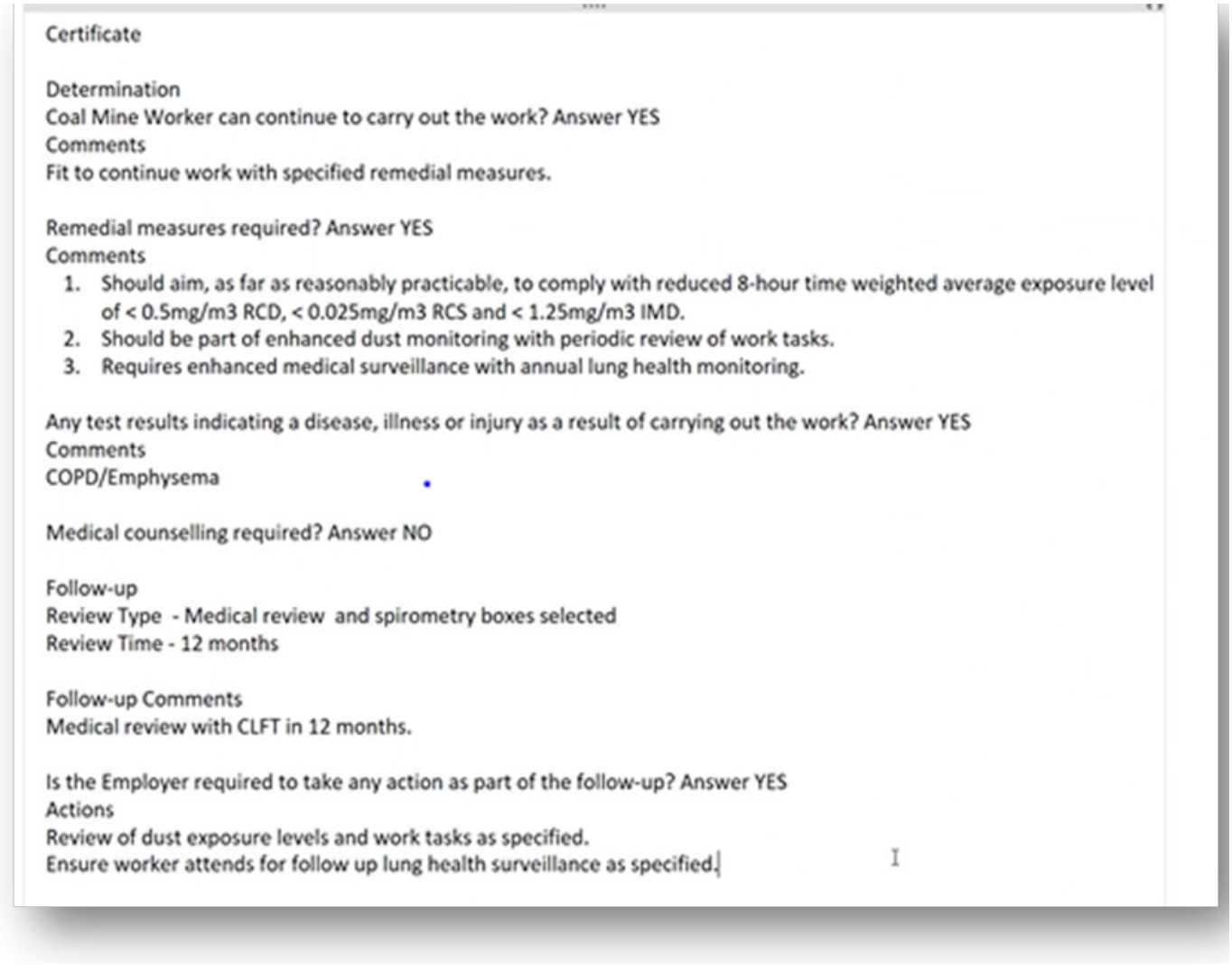
Chest x-ray pathway

Chest x-ray	Action and next steps
Normal	No further action required. The coal mine worker will attend their routine Order 43 periodic health assessment as scheduled.
Routine Abnormal	There are changes on the chest x-ray unrelated to possible CMDLD. The coal mine worker is referred to their GP with follow up as required. This is an existing process at CS Health.
Significant Abnormality	These are any radiological changes that could indicate a possible CMDLD. The coal mine worker is referred for an HRCT scan. **For an existing coal mine worker:** • If HRCT is normal, the coal mine worker attends a routine health assessment review. • If HRCT is abnormal and found to be unrelated to coal mine dust exposure, the coal mine worker is referred to their GP with health assessment review as per routine abnormal process. • If HRCT is abnormal and is consistent with possible CMDLD, the coal mine worker is referred to a respiratory physician. In this instance, the coal mine worker is contacted by CS Health where the findings of the HRCT and further clinical investigation / referral process are explained. Consent from the coal mine worker is requested to discuss the referral with their employer. CS Health liaises with the respiratory physicians and coal mine worker to organise appointments and transfer of clinical information (with coal mine worker consent). CS Health will pay for the respiratory physician assessment and any required testing (with the exception of inpatient procedures, though these are rarely required). **For a new entrant to the NSW coal industry:** • If HRCT is normal, the worker attends a routine health assessment review. • If HRCT is abnormal and found to be unrelated to coal mine dust exposure, the coal mine worker is referred to their GP with health assessment review as per routine abnormal process. • If HRCT is abnormal and is consistent with possible CMDLD, the coal mine worker is referred to their GP for investigation and respiratory physician referral. ***An Order 43 health assessment certificate will not be finalised until all clinical investigations are completed and a diagnosis is confirmed.***

Spirometry/symptoms pathway

Spirometry	Action and next steps
Normal	No further action required. The coal mine worker will attend their routine Order 43 periodic health assessment as scheduled.
Abnormal	The coal mine worker completes bronchodilator responsiveness testing (BRT). Ventolin is used to assess if there is a change to respiratory function BRT, which may indicate the presence of asthma. BRT is recommended for all abnormal spirometry in resource sector respiratory monitoring, as per the TSANZ standard. • **If BRT is positive** (possible asthma) and there are no other clinical factors, the coal mine worker is referred to their GP for a medical management plan; and a six (6) month health assessment review is scheduled. This will normally only apply to young, undiagnosed, or untreated asthmatics as it is intended to avoid unnecessary testing where other significant respiratory disease is very unlikely. The early health assessment review is to confirm the diagnosis and response to any treatment and provide a baseline for future health monitoring. • **If the BRT is negative**, or it is positive but with other factors (such as extensive coal mine dust or smoking exposures), the coal mine worker will be referred for a CLFT.
Serial decline in respiratory function or unexplained symptoms	The coal mine worker will be referred for a CLFT. • If the CLFT is normal, then no further action is required. The coal mine worker attends a routine health assessment review. • If the CLFT shows an early or mild respiratory function impairment, the coal mine worker is referred for an HRCT. • If the CLFT shows more severe respiratory function impairment, the coal mine worker is referred for an HRCT and to a respiratory physician. This follows the same referral process explained above.

Diagram 4: Example of a health assessment certificate detailing remedial measures and restricted dust exposure



Certificate

Determination
Coal Mine Worker can continue to carry out the work? Answer YES
Comments
Fit to continue work with specified remedial measures.

Remedial measures required? Answer YES
Comments
1. Should aim, as far as reasonably practicable, to comply with reduced 8-hour time weighted average exposure level of < 0.5mg/m3 RCD, < 0.025mg/m3 RCS and < 1.25mg/m3 IMD.
2. Should be part of enhanced dust monitoring with periodic review of work tasks.
3. Requires enhanced medical surveillance with annual lung health monitoring.

Any test results indicating a disease, illness or injury as a result of carrying out the work? Answer YES
Comments
COPD/Emphysema

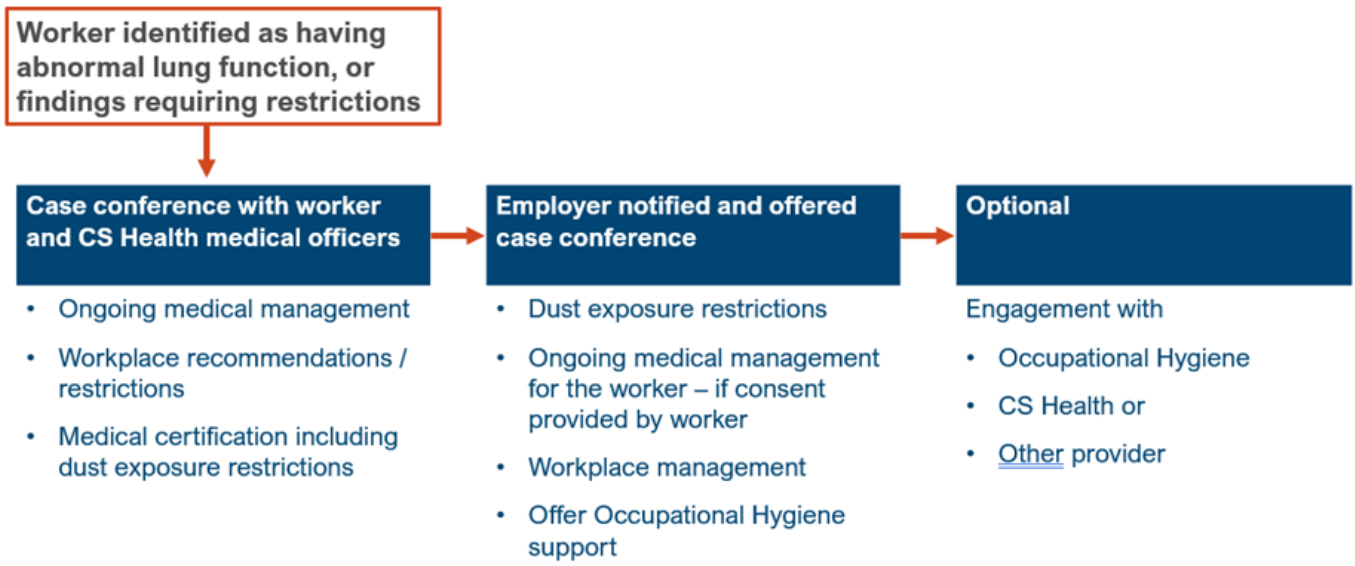
Medical counselling required? Answer NO

Follow-up
Review Type - Medical review and spirometry boxes selected
Review Time - 12 months

Follow-up Comments
Medical review with CLFT in 12 months.

Is the Employer required to take any action as part of the follow-up? Answer YES
Actions
Review of dust exposure levels and work tasks as specified.
Ensure worker attends for follow up lung health surveillance as specified.

Diagram 5: Example of health management process for affected workers and their employers



Support for affected coal mine workers

Being referred to a specialist for further tests can be stressful. Coal mine workers certified with dust exposure restrictions may feel anxious about their job security and livelihood, adding to their stress.

CS Health's Clinical Investigation Team (CIT) will support affected coal mine workers through the referral process and discuss the support options available which may include the workplace Employee Assistance Program.

Roles and responsibilities of the PCBU

In the context of the Respiratory Health Standard, a person conducting business or undertaking (PCBU) is responsible for:

- Ensuring workers complete their Order 43 health assessment and any subsequent review follow ups
- Scheduling Order 43 health assessments as per worker schedule
- Scheduling Order 43 review appointments for workers as required
- Notifying the approved medical practitioner of any health monitoring for hazardous chemical exposure or remote work that is required in addition to standard monitoring
- Ensuring affected coal mine workers adhere to the approved medical practitioner's certification
- The assessment and monitoring of coal mine dust, isocyanate, welding fumes, and any other exposure levels requiring environmental/health monitoring.

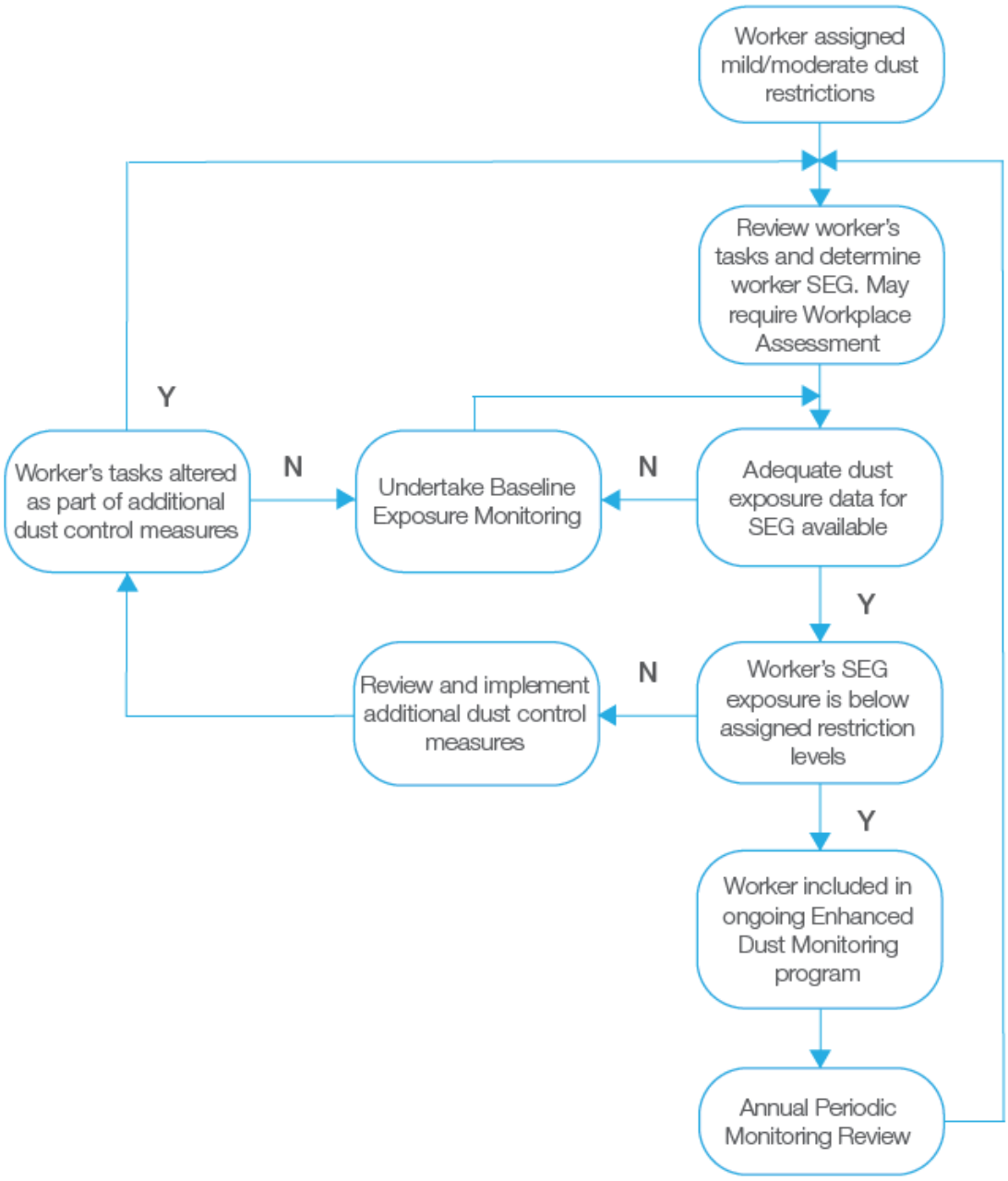
Applying the pathways and guidelines at site

It is important to note that every case of identified respiratory disease will be different. As such, the affected coal mine worker will need to be managed on their individual circumstances as well as that of the mine site where they are working.

If an employer receives a certificate recommending dust exposure restrictions for a coal mine worker, there are several factors to consider.

The diagram below provides guidance for employers in reviewing dust exposure results and developing an ongoing dust sampling strategy. It is recommended that a competent person, such as an occupational hygienist, assists with this review and the development of the sampling strategy.

Diagram 6: Dust exposure review and sampling strategy



- Initially, a review of the coal mine workers' tasks should be undertaken to determine the most appropriate Similar Exposure Group (SEG).
- Next, a review of dust exposure monitoring data should be conducted for the applicable SEG. If adequate exposure monitoring data has not yet been collected, additional monitoring should be carried out over a representative period to assess the SEG's exposure level.
- If the collected data indicates that exposure levels exceed the recommended restrictions, additional controls should be considered and implemented according to the hierarchy of controls. The review of controls may include considering changes to tasks and work areas.
- After implementing any additional controls, the SEG should be reviewed, and exposure levels reassessed through baseline exposure monitoring.

Terms of reference for dust exposure review and sampling strategy

Similar Exposure Group (SEG)	SEGs are groups of workers who share similar exposure risks due to the frequency, manner of tasks performed, and the materials and processes used.
Workplace Assessment	Workplace Assessments involve site inspections to document tasks and identify high-risk exposure activities and relevant controls.
Baseline Exposure Monitoring	Baseline Exposure Monitoring assesses SEG exposure over a representative period, accounting for variations in activities, seasons, operations, work crews, and individual workers. The number of samples collected should enable statistical analysis to assess compliance with dust restriction levels. Various sampling strategies are outlined in the NSW Resources Regulator Guide – Airborne contaminants principal hazard management plan.
Periodic Exposure Monitoring	Periodic Exposure Monitoring ensures that controls remain effective and provides an estimate of the SEG's exposure profile. This monitoring program should be risk-based and conducted at defined intervals, such as annually. Various sampling strategies are referenced in the NSW Resources Regulator Guide – Airborne contaminants principal hazard management plan.
Enhanced Exposure Monitoring	Enhanced Exposure Monitoring aligns with Baseline and Periodic monitoring strategies, with additional focus on workers with assigned dust restrictions. These workers should be periodically monitored to assess individual variations and have periodic reviews of their work tasks, potentially including a Workplace Assessment.

Case Study

Coal mine worker profile

- Male, aged mid-50s
- Long-term coal industry worker, mainly in the underground mining environment
- Smoker

Health assessment outcomes

- Respiratory issues detected; recommends health assessment reviews
- Worker found to have CMDLD and other respiratory conditions
- Health assessment certificate advises restrictions to dust exposure

Employer actions

- Employer receives Order 43 health assessment review report
- Employer reviews exposure data for the mine against the exposure limits advised for the coal mine worker. This is to determine if it is practical for the coal mine worker to continue in their role and still comply with the exposure limits detailed in the Order 43 health assessment review report
- Based on a review of the SEG data and dust levels at the mine over the past two years, the employer determines that the coal mine worker can be accommodated with no changes to their current role.
- A medical management plan is prepared for the coal mine worker that includes:
  - clear direction for the coal mine worker to attend health assessment reviews as required by CS Health
  - direction for the coal mine worker to advise their employer of any concerns or changes in their condition
  - a date to review future work tasks, changes to condition and any new monitoring data

Reference documents

CS Health has developed protocols referencing current guidelines from the TSANZ Standard for respiratory monitoring in resource sector workers. These protocols align with the clinical pathways in place in the Queensland mining industry.

Standards for the delivery of Spirometry for resources sector workers – TSANZ 2022

Mine Dust Lung Disease Clinical Pathways Guideline – RSHQ 2023

Returning workers with mine dust lung disease to the workplace - released by Worksafe Qld Workers' Compensation Regulatory Services.

Information and resources

Resources for approved medical practitioners

CS Health has developed the following resources to assist approved medical practitioners when performing Order 43 health assessments on NSW coal mine workers:

- The NSW Coal Mining Industry Respiratory Health Standard
- Clinical Pathways for Coal Mine Dust Lung Disease Monitoring: supporting clinical guidance notes for medical practitioners
- Guidelines for managing identified lung disease in the coal mining environment

In addition to the above, coal mine workers and employers may find the following information on the Coal Services website: www.coalservices.com.au

Fact sheets for coal mine workers and employers

- Preparing for your Order 43 medical assessment
- Spirometry
- Complex Lung Function Testing (CLFT)
- High Resolution Computed Tomography (HRCT)
- Respiratory physician referrals

Frequently asked questions

A compilation of FAQs from stakeholder meetings and industry forums follows and is also available on the Coal Services website. The FAQs will be reviewed and updated over time as required.

Contact us

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