

VERSION 2.0

# CLINICAL ISSUES

*Work-related asthma*

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## ABBREVIATIONS

<b>CFC</b>	chlorofluorocarbon	<b>LTRA</b>	leukotriene receptor antagonist
<b>COPD</b>	chronic obstructive pulmonary disease	<b>MBS</b>	Medical Benefits Scheme
<b>COX</b>	cyclo-oxygenase	<b>NHMRC</b>	National Health and Medical Research Council
<b>DXA</b>	dual-energy X-ray absorptiometry	<b>NIPPV</b>	non-invasive positive pressure ventilation
<b>ED</b>	emergency department	<b>NSAIDs</b>	nonsteroidal anti-inflammatory drugs
<b>EIB</b>	exercise-induced bronchoconstriction	<b>OCS</b>	oral corticosteroids
<b>FEV<sub>1</sub></b>	forced expiratory volume over one second	<b>OSA</b>	obstructive sleep apnoea
<b>FEV<sub>6</sub></b>	forced expiratory volume over six seconds	<b>PaCO</b>	carbon dioxide partial pressure on blood gas analysis
<b>FSANZ</b>	Food Standards Australia and New Zealand	<b>PaO</b>	oxygen partial pressure on blood gas analysis
<b>FVC</b>	forced vital capacity	<b>PBS</b>	Pharmaceutical Benefits Scheme
<b>GORD</b>	gastro-oesophageal reflux disease	<b>PEF</b>	peak expiratory flow
<b>HFA</b>	formulated with hydrofluoroalkane propellant	<b>pMDI</b>	pressurised metered-dose inhaler or 'puffer'
<b>ICS</b>	inhaled corticosteroid	<b>PPE</b>	personal protective equipment
<b>ICU</b>	intensive care unit	<b>SABA</b>	short-acting beta <sub>2</sub> -adrenergic receptor agonist
<b>IgE</b>	Immunoglobulin E	<b>SAMA</b>	short-acting muscarinic antagonist
<b>IL</b>	interleukin	<b>SaO<sub>2</sub></b>	oxygen saturation
<b>IU</b>	international units	<b>SpO<sub>2</sub></b>	peripheral capillary oxygen saturation measured by pulse oximetry
<b>IV</b>	intravenous	<b>TGA</b>	Therapeutic Goods Administration
<b>LABA</b>	long-acting beta <sub>2</sub> -adrenergic receptor agonist		
<b>LAMA</b>	long-acting muscarinic antagonist		

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# Work-related asthma

## Overview

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Work-related asthma includes both worsening of asthma control (work-exacerbated asthma) and new-onset asthma (occupational asthma) due to workplace conditions.

Work-related asthma is common:

- Approximately one in five adults with asthma experience worsening in asthma control due to their work.
- Workplace factors are responsible for up to one in five cases of new asthma that develops in adulthood.

## In this section

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### *Investigation of WRA*

Investigating suspected work-related asthma

<http://www.asthmahandbook.org.au/clinical-issues/work-related-asthma/investigation>

### *Management of WRA*

Managing work-related asthma

<http://www.asthmahandbook.org.au/clinical-issues/work-related-asthma/management>

### *Prevention of WRA*

Preventing work-related asthma


<http://www.asthmahandbook.org.au/clinical-issues/work-related-asthma/prevention>

## Investigating suspected work-related asthma

### Recommendations

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For all workers with asthma, ask whether asthma symptoms improve on days away from work or during holidays. If so, investigate further.


 *How this recommendation was developed*

**Consensus**

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Aasen *et al.* 2013<sup>1</sup>

When new-onset asthma or worsening of asthma control appears to be caused by workplace factors, consider offering referral to a specialist (e.g. respiratory physician, occupational physician or allergist) with experience in investigating and managing work-related asthma.

 *How this recommendation was developed*

**Consensus**

Based on clinical experience and expert opinion (informed by evidence, where available).

Take a detailed history asking about exposure to airborne substances, and the pattern and timing of symptoms.

*Table. Examples of common sensitising agents and occupations associated with exposure*

Agent	Occupations
<i>Low molecular weight agents</i>	
Wood dust (e.g. western red cedar, redwood, oak)	<ul style="list-style-type: none"> <li>• Carpenters</li> <li>• Builders</li> <li>• Model builders</li> <li>• Sawmill workers</li> <li>• Sanders</li> </ul>
<i>Isocyanates</i>	<ul style="list-style-type: none"> <li>• Automotive industry workers</li> <li>• Adhesive workers</li> <li>• Chemical industry</li> <li>• Mechanics</li> <li>• Painters</li> <li>• Polyurethane foam production workers</li> </ul>

Agent	Occupations
<i>Low molecular weight agents</i>	
<i>High molecular weight agents</i>	
<i>Latex</i>	<ul style="list-style-type: none"> <li>• Food handlers</li> <li>• Healthcare workers</li> <li>• Textile industry workers</li> <li>• Toy manufacturers</li> </ul>
<i>Flour and grain dust</i>	<ul style="list-style-type: none"> <li>• Bakers</li> <li>• Combine harvester drivers</li> <li>• Cooks</li> <li>• Farmers</li> <li>• Grocers</li> <li>• Pizza makers</li> </ul>
<i>Animal allergens (e.g. urine, dander)</i>	<ul style="list-style-type: none"> <li>• Animal breeders</li> <li>• Animal care workers</li> <li>• Jockeys</li> <li>• Laboratory workers</li> <li>• Pet shop workers</li> <li>• Veterinary surgery workers</li> </ul>

Source: Adapted from Hoy R, Abramson MJ, Sim MR. Work related asthma. *Aust Fam Physician* 2010; 39: 39-42. Available from: <http://www.racgp.org.au/afp/201001/35841>

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Table. Questions to consider for patients with suspected work-related asthma

<p><i>Was there any unusual exposure to any substance at work within the 24 hours before symptoms began?</i></p> <p><i>Did the person's co-workers experience respiratory symptoms?</i></p> <p><i>Does the person's asthma symptoms improve when away from work (e.g. weekends, holidays)?</i></p> <p><i>Are symptoms of rhinitis or conjunctivitis worse at work?</i></p>
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Source: Adapted from Tarlo SM, Balmes J, Balkissoon R *et al.* Diagnosis and management of work-related asthma: American College Of Chest Physicians Consensus Statement. *Chest* 2008; 134(3 Suppl): 1S-41S. Available from: <http://journal.publications.chestnet.org/article.aspx?articleid=1044851>

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Table. Features of history in work-related asthma

Adapted from:	Work-exacerbated asthma	Occupational asthma	
		Sensitiser-induced occupational	Irritant-induced occupational

Hoy R, Abramson MJ, Sim MR. Work related asthma. *Australian Family Physician* 2010; 39: 39-42. Available from: <http://www.racgp.org.au/afp/201001/35841>

Tarlo SM, Liss GM. Occupational asthma: an approach to diagnosis and management. *Can Med Assoc J* 2003; 168: 867-71. Available from: <http://www.cmaj.ca/content/168/7/867.full>

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### How this recommendation was developed

#### Adapted from existing guidance

Based on reliable clinical practice guideline(s) or position statement(s):

- Hoy *et al.* 2010<sup>2</sup>
- Tarlo *et al.* 2008<sup>3</sup>

Advise patients to ask their employer to provide information about substances used in the workplace, including a safety data sheet.

### How this recommendation was developed

#### Adapted from existing guidance

Based on reliable clinical practice guideline(s) or position statement(s):

- Hoy *et al.* 2010<sup>2</sup>
- Tarlo *et al.* 2008<sup>3</sup>

## More information

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### *Definition and prevalence of work-related asthma*

Work-related asthma includes work-exacerbated asthma (worsening of asthma control due to workplace factors) and occupational asthma (new-onset asthma).

An estimated 25% of adults with asthma have work-related asthma.<sup>3</sup>

### *Work-exacerbated asthma*

Work-exacerbated asthma refers to worsening of asthma control due to workplace factors (e.g. inhalation of airborne substances, physical exertion or exposure to cold air). It occurs in an estimated 22% of adults with asthma.<sup>4</sup>

People with work-exacerbated asthma experience symptoms on more days, use more healthcare resources and have lower quality of life than people with asthma that is unrelated to work.<sup>4</sup> Persistent exposure to workplace factors that worsen asthma control might result in greater loss of lung function than would occur if the person were not exposed to these factors, but this has not been clearly demonstrated.<sup>4</sup>

### *Occupational asthma*

Occupational asthma refers to new-onset asthma caused by exposure to an airborne substance in the workplace (sensitiser or irritant).

An estimated 16–20% of adult-onset asthma is caused by workplace exposure to sensitisers or irritants.<sup>5, 6</sup> Hundreds of substances are known to cause occupational asthma and more are identified each year.<sup>2</sup> Many of these are found in Australian workplaces.<sup>7</sup>

Occupational asthma is preventable if exposure to sensitisers and irritants is identified and controlled.

Undiagnosed occupational asthma results in ongoing poor asthma control, increasing dose requirements for asthma medicines, and possibly irreversible decline in lung function.<sup>2, 8</sup> Deaths from occupational asthma have been reported.<sup>2, 9</sup>

There are two forms of occupational asthma:

- sensitiser-induced occupational asthma (allergic mechanism)
- irritant-induced occupational asthma (non-allergic mechanism).

### Sensitiser-induced occupational asthma

Sensitiser-induced occupational asthma develops after a period of exposure (a few days to several years) to a specific substance (e.g. inhaled protein or other chemical) in the workplace.<sup>2</sup>

People with a history of atopy have higher risk of developing sensitiser-induced occupational asthma when exposed to some antigens (e.g. animal proteins, flour). Symptoms of rhinitis (e.g. sneezing, nasal congestion) often occur at work before occupational asthma develops.<sup>3</sup>

Employers should be aware of the risk associated with the use of sensitising agents and should control workers' exposure, as far as is practical.<sup>7</sup> Comprehensive lists of identified sensitising agents are available from the OASYS research group, Midland Thoracic Society, UK and the UK government Health and Safety Executive.

**Table. Examples of common sensitising agents and occupations associated with exposure**

Agent	Occupations
<i>Low molecular weight agents</i>	
<i>Wood dust (e.g. western red cedar, redwood, oak)</i>	<ul style="list-style-type: none"> <li>• Carpenters</li> <li>• Builders</li> <li>• Model builders</li> <li>• Sawmill workers</li> <li>• Sanders</li> </ul>
<i>Isocyanates</i>	<ul style="list-style-type: none"> <li>• Automotive industry workers</li> <li>• Adhesive workers</li> <li>• Chemical industry</li> <li>• Mechanics</li> <li>• Painters</li> <li>• Polyurethane foam production workers</li> </ul>
<i>Formaldehyde</i>	<ul style="list-style-type: none"> <li>• Cosmetics industry</li> <li>• Embalmers</li> <li>• Foundry workers</li> <li>• Hairdressers</li> <li>• Healthcare workers</li> <li>• Laboratory workers</li> <li>• Tanners</li> <li>• Paper, plastics and rubber industry workers</li> </ul>
<i>Platinum salts</i>	<ul style="list-style-type: none"> <li>• Chemists</li> <li>• Dentists</li> <li>• Electronics industry workers</li> <li>• Metallurgists</li> <li>• Photographers</li> </ul>



Agent	Occupations
<i>Low molecular weight agents</i>	
<i>High molecular weight agents</i>	
<i>Latex</i>	<ul style="list-style-type: none"> <li>• Food handlers</li> <li>• Healthcare workers</li> <li>• Textile industry workers</li> <li>• Toy manufacturers</li> </ul>
<i>Flour and grain dust</i>	<ul style="list-style-type: none"> <li>• Bakers</li> <li>• Combine harvester drivers</li> <li>• Cooks</li> <li>• Farmers</li> <li>• Grocers</li> <li>• Pizza makers</li> </ul>
<i>Animal allergens (e.g. urine, dander)</i>	<ul style="list-style-type: none"> <li>• Animal breeders</li> <li>• Animal care workers</li> <li>• Jockeys</li> <li>• Laboratory workers</li> <li>• Pet shop workers</li> <li>• Veterinary surgery workers</li> </ul>

Source: Adapted from Hoy R, Abramson MJ, Sim MR. Work related asthma. *Aust Fam Physician* 2010; 39: 39-42. Available from: <http://www.racgp.org.au/afp/201001/35841>

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- Go to: OASYS research group's information on [Causative agents](#)
- Go to: UK government Health and Safety Executive's [Asthma](#) information

### **Irritant-induced occupational asthma**

Irritant-induced occupational asthma is due to an inflammatory (non-immunological) response of the lower respiratory tract to exposure to an irritant in the workplace. Respiratory symptoms typically occur within minutes to hours of exposure.<sup>2</sup> Reactive airways dysfunction syndrome (a type of irritant-induced occupational asthma) occurs after a single massive exposure to an irritant.<sup>2</sup>

Recurrent low-level exposure might also result in irritant-induced occupational asthma, but this has not been clearly demonstrated.<sup>2</sup>

### **Investigation of work-related asthma symptoms**

Asking all workers with asthma whether their asthma symptoms improve when away from work is a useful screening tool. Those who answer 'yes' need investigation for work-related asthma.<sup>1</sup>

Investigation of suspected work-related asthma is complex. It involves confirming the diagnosis of asthma, identifying the workplace as the cause of asthma symptoms, and identifying the specific causal agents. This involves taking a detailed history, further investigations (e.g. serial peak expiratory flow measurement, skin prick tests, bronchial provocation [challenge] testing) and sometimes worksite visits.<sup>2,3</sup>

People with suspected work-related asthma should ask their employer to provide a safety data sheet containing information about the constituents and properties of substances used at the workplace. Information about safety data sheets (previously called Material

Safety Data Sheets) is available from Safe Work Australia.

Accurate diagnosis and documentation are essential to support a potential Workers Compensation claim. This normally requires a report from a specialist with experience investigating work-related asthma.

► Go to: [Safe Work Australia](#)

### Definition of variable expiratory airflow limitation

Most of the tests for variable expiratory airflow limitation are based on showing variability in FEV<sub>1</sub>. While reduced FEV<sub>1</sub> may be seen with many other lung diseases (or due to poor spirometric technique), a reduced ratio of FEV<sub>1</sub> to FVC indicates airflow limitation.<sup>10</sup> Normal FEV<sub>1</sub>/FVC values derived from population studies vary,<sup>11, 12</sup> but are usually greater than:<sup>11</sup>

- 0.85 in people aged up to 19 years
- 0.80 in people aged 20–39 years
- 0.75 in people aged 40–59 years
- 0.70 in people aged 60–80 years.

In children, it is less useful to define expiratory airflow limitation according to a specific cut-off for FEV<sub>1</sub>/FVC ratio, because normal values in children change considerably with age.<sup>12</sup>

Some spirometers provide predicted normal values specific to age group. If these are available, a FEV<sub>1</sub>/FVC ratio less than the lower limit of normal (i.e. less than the 5th percentile of normal population) indicates airflow limitation.

Variable expiratory airflow limitation (beyond the range seen in healthy populations) can be documented if any of the following are recorded:

- a clinically important increase in FEV<sub>1</sub> (change in FEV<sub>1</sub> of at least 200 mL and 12% from baseline for adults, or at least 12% from baseline for children) 10–15 minutes after administration of bronchodilator
- clinically important variation in lung function (at least 20% change in FEV<sub>1</sub>) when measured repeatedly over time (e.g. spirometry on separate visits)
- a clinically important reduction in lung function (decrease in FEV<sub>1</sub> of at least 200 mL and 12% from baseline on spirometry, or decrease in peak expiratory flow rate by at least 20%) after exercise (formal laboratory-based exercise challenge testing uses different criteria for exercise-induced bronchoconstriction)
- a clinically important increase in lung function (at least 200 mL and 12% from baseline) after a trial of 4 or more weeks of treatment with an inhaled corticosteroid
- clinically important variation in peak expiratory flow (diurnal variability of more than 10%)
- a clinically important reduction in lung function (15–20%, depending on the test) during a test for airway hyperresponsiveness (exercise challenge test or bronchial provocation test) measured by a respiratory function laboratory.

### Notes

Patients referred to a respiratory function laboratory may be asked not to take certain medicines within a few hours to days before a spirometry visit.

A clinically important increase or decrease in lung function is defined as a change in FEV<sub>1</sub> of at least 200 mL and 12% from baseline for adults, or at least 12% from baseline for children, or a change in peak expiratory flow rate of at least 20% on the same meter.<sup>13, 10</sup> A clinically important increase in FVC after administering bronchodilator may also indicate reversible airflow limitation, but FVC is a less reliable measure in primary care because FVC may vary due to factors such as variation in inspiratory volume or expiratory time.

The finding of 'normal' lung function during symptoms reduces the probability that a patient has asthma, but a clinically important improvement in response to bronchodilator or inhaled corticosteroid can occur in patients whose baseline value is within the predicted normal range.

The greater the variation in lung function, the more certain is the diagnosis of asthma. However, people with longstanding asthma may develop fixed airflow limitation.

Reversibility in airflow limitation may not be detected if the person is already taking a long-acting beta<sub>2</sub> agonist or inhaled corticosteroid.

Airflow limitation can be transient and does not necessarily mean that the person has asthma (e.g. when recorded during a severe acute infection of the respiratory tract). Ideally, airflow limitation should be confirmed when the patient does not have a respiratory tract infection. Reduction in lung function during a respiratory tract infection with improvement in lung function after its resolution, commonly occurs in people with asthma, but can also be seen in patients with COPD or in healthy people without either asthma or COPD.<sup>14,15</sup>

► Go to: National Asthma Council Australia's [Spirometry Resources](#)  
Go to: National Asthma Council Australia and Woolcock Institute [Peak Flow Chart](#)

### Referral options for investigation of work-related asthma

To identify a specialist with experience investigating work-related asthma, consult the Thoracic Society of Australia and New Zealand or the Australasian Faculty of Occupational and Environmental Medicine.

► Go to: [Thoracic Society of Australia and New Zealand](#)

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## Managing work-related asthma

### Recommendations

Manage work-related asthma as for other asthma, using a stepped approach to medication and adjusting to maintain good control at the lowest effective dose, with an emphasis on avoiding exposure to workplace triggers.

*Table. Guide to selecting and adjusting asthma medication for adults and older adolescents*

Clinical situation	Action
<i>Newly diagnosed asthma</i>	<p>Consider low-dose ICS (plus SABA as needed)</p> <p>If symptoms severe at initial presentation, consider one of:</p> <ul style="list-style-type: none"> <li>• ICS plus a short course of oral corticosteroids</li> <li>• a short initial period of high-dose ICS then step down</li> <li>• (private prescription) combination ICS/LABA<sup>†</sup></li> </ul> <p>See: <a href="#">Table. Initial treatment choices (adults and adolescents not already using a preventer)</a></p>
<i>Good recent asthma symptom control</i>	If maintained 2–3 months, no flare-up in previous 12 months and low risk for flare-ups, step down where possible (unless already on low-dose ICS)
<i>Partial recent asthma symptom control</i>	<p>Review inhaler technique and adherence – correct if suboptimal</p> <p>If no improvement, consider increasing treatment by one step and reviewing (if still no improvement, return to previous step, review diagnosis and consider referral)</p>
<i>Poor recent asthma symptom control</i>	<p>Review inhaler technique and adherence – correct if suboptimal</p> <p>Confirm that symptoms are likely to be due to asthma</p> <p>Consider increasing treatment until good asthma control is achieved, then step down again when possible</p>
<i>Difficult-to-treat asthma ‡</i>	Consider referral for assessment or add-on options
<i>Patient with risk factors §</i>	Tailor treatment to reduce individual risk factors

<sup>†</sup> PBS status as at March 2019: ICS/LABA combination therapy as first-line preventer treatment is not subsidised by the PBS, except for patients with frequent symptoms while taking oral corticosteroids.

<sup>‡</sup> Poor recent asthma symptom control despite ICS/LABA combination at high–medium dose.

## § Risk factors for asthma events or adverse treatment effects, irrespective of level of recent asthma symptom control.

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Figure. Stepped approach to adjusting asthma medication in adults and adolescents

Please view and print this figure separately: <http://www.astmahandbook.org.au/figure/show/31>

### How this recommendation was developed

#### Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Aasen *et al.* 2013<sup>1</sup>
- Baur *et al.* 2012<sup>2</sup>
- Dykewics, 2009<sup>3</sup>
- Heederik *et al.* 2012<sup>4</sup>
- Henneberger *et al.* 2011<sup>5</sup>
- Hoy R *et al.* 2009<sup>6</sup>
- Tarlo *et al.* 2008<sup>7</sup>
- Vandenplas *et al.* 2011<sup>8</sup>

**Advise people with work-exacerbated asthma or irritant-induced occupational asthma that they may be able to control their asthma while continuing their job, provided that their employer undertakes effective measures to minimise their exposure to triggers in the workplace.**

### How this recommendation was developed

#### Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Aasen *et al.* 2013<sup>1</sup>
- Baur *et al.* 2012<sup>2</sup>
- Dykewics, 2009<sup>3</sup>
- Heederik *et al.* 2012<sup>4</sup>
- Henneberger *et al.* 2011<sup>5</sup>
- Hoy *et al.* 2010<sup>6</sup>
- Tarlo *et al.* 2008<sup>7</sup>
- Vandenplas *et al.* 2011<sup>8</sup>

**Advise people with confirmed sensitiser-induced occupational asthma that:**

- the prognosis is best if they completely avoid exposure, beginning early after developing symptoms
- their asthma may not improve unless they can completely avoid exposure.

### How this recommendation was developed


#### Consensus

Based on clinical experience and expert opinion (informed by evidence, where available), with particular reference to the following source(s):

- Aasen *et al.* 2013<sup>1</sup>
- Baur *et al.* 2012<sup>2</sup>
- Dykewics, 2009<sup>3</sup>
- Heederik *et al.* 2012<sup>4</sup>
- Henneberger *et al.* 2011<sup>5</sup>

- Hoy *et al.* 2010<sup>6</sup>
- Tarlo *et al.* 2008<sup>7</sup>
- Vandenplas *et al.* 2011<sup>8</sup>


For patients with occupational asthma, offer referral to a specialist (e.g. respiratory physician, occupational physician or allergist) with experience in investigating and managing work-related asthma, if possible.

 *How this recommendation was developed*

**Consensus**

Based on clinical experience and expert opinion (informed by evidence, where available).

For any patient who is considering leaving their job due to asthma symptoms, offer referral to a specialist (e.g. respiratory physician, occupational physician or allergist) with experience in investigating and managing work-related asthma.

 *How this recommendation was developed*

**Consensus**

Based on clinical experience and expert opinion (informed by evidence, where available).

## More information

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### *Referral options for investigation of work-related asthma*

To identify a specialist with experience investigating work-related asthma, consult the Thoracic Society of Australia and New Zealand or the Australasian Faculty of Occupational and Environmental Medicine.

- ▶ Go to: [Thoracic Society of Australia and New Zealand](#)
- Go to: [Australasian Faculty of Occupational and Environmental Medicine](#)

### *Advice for patients about work-related asthma*

#### **Choice of occupation or workplace**

There is insufficient evidence to determine whether people with asthma or allergies should avoid certain jobs to avoid developing work-related asthma.

People with existing asthma or atopy might consider avoiding workplaces where employers cannot prevent exposure to known sensitisers or irritants.<sup>5</sup> They should be made aware of risks when considering employment at such workplaces.

#### **Patients with work-exacerbated asthma or irritant-induced occupational asthma**

Unless asthma is severe, patients with work-exacerbated asthma or irritant-induced occupational asthma can usually remain in their job if exposure to workplace triggers and respiratory irritants can be minimised (e.g. by changing tasks, improving ventilation or work processes, or use of a face mask and respirator to avoid short-term exposure).<sup>6</sup>

#### **Patients with sensitiser-induced occupational asthma**

For sensitiser-induced occupational asthma, optimal management involves completely avoiding exposure as soon as possible.<sup>6</sup> Compared with complete avoidance, reduced exposure to sensitisers is associated with a higher risk of failure to improve, worsening symptoms and nonspecific bronchial hyperresponsiveness.<sup>8</sup> Patients should be offered assessment by a specialist in occupational asthma before giving up their job.

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# Preventing work-related asthma

## Recommendations

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When educating people with allergies or asthma on self-management, explain the risks of work-related asthma, especially in workplaces where they are exposed to sensitisers or irritants, and advise them what to do if they experience symptoms at work. However, do not routinely advise people with asthma against certain occupations so as to avoid developing work-related asthma.

 *How this recommendation was developed*

### Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

Warn workers (especially those with a history of asthma or atopy) against potential respiratory hazards in the workplace, and advise them about early symptoms of work-related asthma.

 *How this recommendation was developed*

### Consensus

Based on clinical experience and expert opinion (informed by evidence, where available).

## More information

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### *Referral options for investigation of work-related asthma*

To identify a specialist with experience investigating work-related asthma, consult the Thoracic Society of Australia and New Zealand or the Australasian Faculty of Occupational and Environmental Medicine.

- ▶ Go to: [Thoracic Society of Australia and New Zealand](#)
- Go to: [Australasian Faculty of Occupational and Environmental Medicine](#)

### *Prevention of work-related asthma within the workplace*

Work-related asthma is potentially preventable. Preventive measures focus on controlling workers' exposure to respiratory irritants and sensitisers at the workplace, and must be undertaken by employers.

An Australian report has recommended that employers should minimise exposure to sensitisers and irritants for all workers in high-risk workplaces.<sup>1</sup> Actions by employers should be guided by occupational health and safety authorities and specialists with expertise in work-related asthma.

Prevention strategies currently in use include:

- elimination of the substance from the workplace (e.g. substituting the substance, remote control handling)
- reducing exposure (e.g. safety procedures, training)
- isolating the substance (e.g. changed work processes, segregation of areas)
- ventilation
- wearing personal respirators, protective clothing and masks.

The most effective strategy is to eliminate or minimise exposures at the source or in the environment.<sup>2,3</sup>

Avoiding the use of powdered latex gloves (e.g. substituting with low-protein, powder-free natural rubber latex gloves or latex-free gloves) reduces natural rubber latex aeroallergens, natural rubber latex sensitisation and natural rubber latex asthma in healthcare workers.<sup>2</sup>



There is limited evidence that the use of respirators is effective in preventing occupational asthma.<sup>2</sup> Most studies have measured effects of respirators on exposure, not asthma incidence. Limited evidence suggests that the risk of developing asthma among workers using hexahydrophthalic anhydride in epoxy resin manufacture may be reduced by wearing respirators. A combination of information and training, exhaust ventilation, and wearing of respirators while handling of powdered bread improvers may reduce the risk of symptomatic sensitisation to flour and fungal amylase in bakers. Small studies suggest that respirators can reduce exposure to isocyanates among spray painters if they are well designed, fitted and maintained, and workers are trained to use them correctly.

If a face mask is recommended to minimise exposure to a particular sensitiser or irritant, the employer should select the appropriate type, and provide the worker with education and training to use it properly. Personal protection should be part of a comprehensive control program – not the sole strategy for reducing exposure.

If an employee develops work-related asthma, this should be considered as a warning that other workers may be at risk and that control measures at the workplace should be reviewed.

### *Advice for patients about work-related asthma*

#### **Choice of occupation or workplace**

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People with existing asthma or atopy might consider avoiding workplaces where employers cannot prevent exposure to known sensitisers or irritants.<sup>4</sup> They should be made aware of risks when considering employment at such workplaces.

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