



Complete Summary

GUIDELINE TITLE

Guidelines for the prevention, identification and management of occupational asthma: evidence review and recommendations.

BIBLIOGRAPHIC SOURCE(S)

British Occupational Health Research Foundation (BOHRF). Guidelines for the prevention, identification and management of occupational asthma: evidence review and recommendations. London (UK): British Occupational Health Research Foundation (BOHRF); 2004. 88 p. [223 references]

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Allergic occupational asthma

GUIDELINE CATEGORY

Diagnosis
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Allergy and Immunology
Family Practice
Internal Medicine
Pulmonary Medicine

INTENDED USERS

Advanced Practice Nurses
Nurses
Patients
Physician Assistants
Physicians
Respiratory Care Practitioners

GUIDELINE OBJECTIVE(S)

- To improve the prevention, identification, and management of occupational asthma in primary care and in occupational health settings by providing evidence-based recommendations on which future practice and management can be based
- To assist the Health & Safety Commission's and Health & Safety Executive's aim to reduce the incidence of asthma caused by substances at work by 30% by 2010

TARGET POPULATION

Workers who may be exposed to substances at work that can cause asthma

INTERVENTIONS AND PRACTICES CONSIDERED

Risk Assessment/Prognosis

Identify risks associated with occupational asthma

Prevention

1. Reduce airborne exposure
2. Respiratory protective equipment
3. Pre-placement examination
4. Periodic health surveillance
 - Respiratory questionnaire
 - Spirometry
 - Immunoglobulin E (IgE) by skin prick test or serology

Diagnosis

1. Referral to specialist in occupational asthma
2. Respiratory questionnaires
3. Expert medical history and examination
4. Lung function tests
 - Forced expiratory volume in 1 second (FEV1)

- Peak expiratory flow (PEF)
5. Nonspecific reactivity testing
 6. Specific IgE testing
 7. Specific bronchial provocation testing

Management/Treatment

1. Identification of prognostic factors
2. Respiration protective equipment
3. Removal of worker from exposure to substances at work that trigger asthma
4. Pharmacologic management, such as inhaled corticosteroids

MAJOR OUTCOMES CONSIDERED

- Risk and incidence of occupational asthma
- Sensitivity and specificity of diagnostic testing
- Efficacy of intervention measures at reducing the risk, incidence and severity of occupational asthma
- Symptom improvement/prevention

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases
Searches of Unpublished Data

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The literature was searched using standard methods. MEDLINE and EMBASE were searched systematically from 1966 and 1974, respectively, to the end of June 2004 for relevant articles published in all languages, using a number of search terms including:

- Occupational asthma
- Agents known to cause occupational asthma, asthmagens

Additional searching included personal bibliographies, selected Internet searches, citation tracking, scanning of relevant journals in the field, and papers known to be "in press" at the end of June 2004.

More than 2,500 titles and abstracts were considered. Narrative reviews were excluded. Abstracts were reviewed independently by two reviewers to identify papers to be requested for review. 474 papers were obtained and independently critically appraised and assessed for methodological quality, using a standard proforma. Where reviewers disagreed about the score of the paper or its relevance to this research, they discussed it to reach resolution. Where resolution was not achieved, a third reviewer was involved. At this stage, further references were excluded and pertinent data from the remaining 223 papers were entered

into an evidence table. The main conclusions are described in the evidence table. This table was reviewed in order to formulate evidence statements and recommendations.

NUMBER OF SOURCE DOCUMENTS

223 papers

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

The strength of evidence for each statement is graded using both the Scottish Intercollegiate Guidelines Network (SIGN) system and the Royal College of General Practitioners (RCGP) three star system (1995) as modified in the Swedish Council on Technology Assessment in Health Care report for scientific studies and the British Occupational Health Research Foundation (BOHRF) Occupational Health Guidelines for the Management of Low Back Pain at Work.

Royal College of General Practitioners Three Star System:

*** Strong evidence – provided by generally consistent findings in multiple, high quality scientific studies

** Moderate evidence – provided by generally consistent findings in fewer, smaller, or lower quality scientific studies

* Limited or contradictory evidence – provided by one scientific study or inconsistent findings in multiple scientific studies

- No scientific evidence – based on clinical studies, theoretical considerations, and/or clinical consensus

Revised Scottish Intercollegiate Guidelines Network Grading System

Levels of Evidence

1++ - High quality meta-analyses, systematic reviews of randomised controlled trials, or randomised controlled trials with a very low risk of bias

1+ - Well conducted meta-analyses, systematic reviews of randomised controlled trials, or randomised controlled trials with a low risk of bias

1- - Meta-analyses, systematic reviews of randomised controlled trials, or randomised controlled trials with a high risk of bias

2++ - High quality systematic reviews of case-control or cohort studies. High quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal

2+ - Well conducted case control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal

2- - Case control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 - Non-analytic studies (e.g. case reports, case series)

4 - Expert opinion

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

223 papers were entered into an evidence table. The main conclusions are described in the evidence table. This table was reviewed in order to formulate evidence statements and recommendations.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Review of evidence statements and strength of evidence against scoping questions pre-identified by research working group and approved by external reviewers.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Revised Scottish Intercollegiate Guidelines Network

Grades of Recommendation

A - At least one meta-analysis, systematic review, or randomised controlled trial rated as 1++, and directly applicable to the target population; or a systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results

B - A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 1++ or 1+

C - A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or extrapolated evidence from studies rated as 2++

D - Evidence level 3 or 4; or extrapolated evidence from studies rated as 2+

Good Practice Points - The guidelines include good practice points where there is no, and nor is there likely to be, research evidence. They are based on the clinical experience of the research-working group, legal requirement, or other consensus.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Guideline developers acknowledge external reviewers in the original guideline document.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The strength of recommendation grading (A–D, Good Practice Points) and level of evidence (I++ to 4 and *** to -) are defined at the end of the "Major Recommendations" field.

- 1. Employers, health and safety personnel and health practitioners should be aware that at least 1 in 10 cases of new or recurrent asthma in adult life are attributable to occupation. ***Scottish Intercollegiate Guidelines Network (SIGN) A**

*** SIGN 2++ Occupational factors are estimated to account for 9–15% of cases of asthma in adults of working age, including new onset or recurrent disease.
- 2. Employers and their health and safety personnel should be aware of the very large number of agents known to cause occupational asthma and the risk of exposure to such agents. ** SIGN B**

*** SIGN 2++ The most frequently reported agents include isocyanates, flour and grain dust, colophony and fluxes, latex, animals, aldehydes, and wood dust.

- 3. Employers and their health and safety personnel should be aware that the major determinant of risk for the development of occupational asthma is the level of exposure to its causes. ** SIGN B**

*** SIGN 2++ The risk of sensitisation and occupational asthma is increased by higher exposures to many workplace agents.

- 4. Health practitioners should not use poorly discriminating factors, such as atopy, family or personal history of asthma, cigarette smoking, and human leukocyte antigen (HLA) phenotype, which increase individual susceptibility to exposure as a reason to exclude individuals from employment. * SIGN D**

* SIGN 3 The positive predictive values of screening criteria are too poorly discriminating for screening out potentially susceptible individuals, particularly in the case of atopy where the trait is highly prevalent.

* SIGN 3 A previous history of asthma is not significantly associated with occupational asthma.

- 5. Employers should implement programmes to prevent (i.e., reduce the incidence of) occupational asthma by removing or reducing exposure to its causes through elimination or substitution and, where this is not possible, by effective control of exposure. ** SIGN B**

*** SIGN 2++ The risk of sensitisation and occupational asthma is increased by higher exposures to many workplace agents.

** SIGN 2+ Reducing airborne exposure reduces the incidence of sensitisation and occupational asthma.

* SIGN 3 The use of respiratory protective equipment reduces the incidence of, but does not completely prevent, occupational asthma.

- 6. Employers and their health and safety personnel should ensure that when respiratory protective equipment is worn, the appropriate type is used and maintained, fit testing is performed and workers understand how to wear, remove, and replace their respiratory protective equipment. * SIGN D**

* SIGN 3 The use of respiratory protective equipment reduces the incidence of, but does not completely prevent, occupational asthma.

- 7. Employers and their health and safety personnel should inform workers about any causes of occupational asthma in the workplace and the need to report any relevant symptoms as soon as they develop. ** SIGN D**

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have shorter duration of symptoms prior to diagnosis.

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have relatively normal lung function at the time of diagnosis.

8. Employers and their health and safety personnel should be aware that for many causes the risk of developing occupational asthma is greatest during the early years of exposure. ** SIGN C

** SIGN 2+ Sensitisation and occupational asthma are most likely to develop in the first years of exposure for workers exposed to enzymes, complex platinum salts, isocyanates, and laboratory animal allergens.

9. Employers and their health and safety personnel should provide regular health surveillance to workers where a risk of occupational asthma is identified. Surveillance should include a respiratory questionnaire enquiring about work-related upper and lower respiratory symptoms, with additional functional and immunological tests, where appropriate. ** SIGN C

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have relatively normal lung function at the time of diagnosis.

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have shorter duration of symptoms prior to diagnosis.

* SIGN 3 Health surveillance can detect occupational asthma at an earlier stage of disease, and outcome is improved in workers who are included in a health surveillance programme.

10. Health practitioners should provide workers at risk of occupational asthma with health surveillance at least annually and more frequently in the first two years of exposure. ** SIGN C

** SIGN 2+ Sensitisation and occupational asthma are most likely to develop in the first years of exposure for workers exposed to enzymes, complex platinum salts, isocyanates, and laboratory animal allergens.

11. Health practitioners should provide more frequent health surveillance to workers who develop rhinitis when working with agents known to cause occupational asthma and ensure that the workplace and working practices are investigated to identify potential causes and implement corrective actions. ** SIGN C

** SIGN 2+ Occupational rhinitis and occupational asthma frequently occur as comorbid conditions in the case of immunoglobulin E (IgE)-associated occupational asthma.

** SIGN 2+ Rhino-conjunctivitis is more likely to appear before the onset of IgE-associated occupational asthma.

* SIGN 2- The risk of developing occupational asthma is highest in the year after the onset of occupational rhinitis.

12. **Health practitioners should provide more frequent health surveillance to any workers who have preexisting asthma to detect any evidence of deterioration. Good Practice Point**
13. **Health practitioners should consider the use of skin prick or serological tests as part of the health surveillance of workers exposed to agents that cause IgE-associated occupational asthma to assess the effectiveness of the control of exposure and the risk of occupational asthma among workers. Good Practice Point**

** SIGN 2+ Skin prick testing and blood sampling of exposed workers to conduct immunological tests is feasible in the workplace.

14. **Health practitioners should enquire of any adult patient with new, recurrent, or deteriorating symptoms of rhinitis or asthma about their job, the materials with which they work, and whether their symptoms improve regularly when away from work. *** SIGN A**

*** SIGN 2++ Occupational factors are estimated to account for 9–15% of cases of asthma in adults of working age, including new onset or recurrent disease.

*** SIGN 2++ The workers most commonly reported from surveillance schemes reported of occupational asthma include bakers and pastry makers, paint sprayers, nurses, chemical workers, animal handlers, food processing workers, timber workers, and welders.

** SIGN 2+ The workers reported from population studies to be at increased risk of developing asthma include bakers, food processors, forestry workers, chemical workers, plastics and rubber workers, metal workers, welders, textile workers, electrical and electronic production workers, storage workers, farm workers, waiters, cleaners, painters, plastic workers, dental workers, and laboratory technicians.

*** SIGN 2++ The most frequently reported agents include isocyanates, flour and grain dust, colophony and fluxes, latex, animals, aldehydes, and wood dust.

** SIGN 2+ In the clinical setting questionnaires that identify symptoms of wheeze and/or shortness of breath which improve on days away from work or on holiday have a high sensitivity, but relatively low specificity for occupational asthma.

15. **Employers and their health and safety personnel should assess exposure in the workplace and enquire of relevant symptoms among the workforce when any one employee develops confirmed occupational rhinitis or occupational asthma and identify opportunities to institute remedial measures to protect other workers. Good Practice Point**
16. **Health practitioners should be aware that the prognosis of occupational asthma is improved by early identification and early avoidance of further exposure to its cause. ** SIGN B**

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have relatively normal lung function at the time of diagnosis.

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have shorter duration of symptoms prior to diagnosis.

17. **Health practitioners who suspect a worker of having occupational asthma should make an early referral to a physician with expertise in occupational asthma. Good Practice Point**
18. **Health practitioners who suspect a worker of having occupational asthma should arrange for workers to perform serial peak flow measurements at least four times a day. ** SIGN D**

** SIGN 3 Acceptable peak flow series can be obtained in around two-thirds of those in whom a diagnosis of occupational asthma is being considered.

* SIGN 3 The diagnostic performance of serial peak flow measurements falls when fewer than four readings a day are made.

** SIGN 3 There is high level of agreement between expert interpretations of serial peak flow records.

** SIGN 3 The sensitivity and specificity of serial peak flow measurements are high in the diagnosis of occupational asthma.

19. **Physicians should confirm a diagnosis of occupational asthma supported by objective criteria (functional, immunological, or both) and not on the basis of a compatible history alone because of the potential implications for future employment. ** SIGN B**

** SIGN 2+ In the clinical setting questionnaires that identify symptoms of wheeze and/or shortness of breath which improve on days away from work or on holiday have a high sensitivity, but relatively low specificity for occupational asthma.

* SIGN 3 Free histories taken by experts have high sensitivity, but their specificity may be lower. These values may be affected by differences in language and populations.

** SIGN 2- Approximately one-third of workers with occupational asthma are unemployed up to 6 years after diagnosis.

** SIGN 2- Workers with occupational asthma suffer financially.

20. Employers and their health and safety personnel should ensure that measures are taken to ensure that workers diagnosed as having occupational asthma avoid further exposure to its cause in the workplace. ** SIGN B

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who are removed from exposure completely.

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who have shorter duration of symptoms prior to removal from exposure.

* SIGN 3 Redeployment to a low exposure area may lead to improvement or resolution of symptoms or prevent deterioration in some workers; however, there is contradictory evidence from other studies, which show that redeployment does not lead to improvement in symptoms or prevent deterioration of symptoms.

21. Physicians treating patients with occupational asthma should follow published clinical guidelines for the pharmacological management of patients with asthma in conjunction with recommendations to avoid exposure to the causative agent. Good Practice Point

22. Health practitioners should enquire about preexisting occupational asthma to agents that job applicants might be exposed to in their new job and advise affected applicants that they are not fit to undertake this work. ** SIGN B

** SIGN 2+ The likelihood of improvement or resolution of symptoms or of preventing deterioration is greater in workers who are removed from exposure completely.

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Good Practice Points - The guidelines include good practice points where there is no, and nor is there likely to be, research evidence. They are based on the clinical experience of the research-working group, legal requirement, or other consensus.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Improvement in the prevention, identification, and management of occupational asthma

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- The guidelines do not intend to provide a list of the several hundred agents known to cause asthma. New causes of occupational asthma are reported regularly and such information is available elsewhere. Neither do they discuss non-occupational asthma except insofar as reviewing the evidence as to whether preexisting asthma or a history of asthma are risk factors for developing occupational asthma.
- It is not intended, nor should it be taken to imply, that these guidelines override existing legal obligations. Duties under the Health and Safety at

Work Act 1974, the Management of Health and Safety at Work Regulations 1999, the Disability Discrimination Act 1995, the Control of Substances Hazardous to Health Regulations 2002, and other relevant legislation must be given due consideration.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Patient Resources
Quick Reference Guides/Physician Guides

For information about [availability](#), see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

British Occupational Health Research Foundation (BOHRF). Guidelines for the prevention, identification and management of occupational asthma: evidence review and recommendations. London (UK): British Occupational Health Research Foundation (BOHRF); 2004. 88 p. [223 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004

GUIDELINE DEVELOPER(S)

British Occupational Health Research Foundation - Private Nonprofit Organization

SOURCE(S) OF FUNDING

British Occupational Health Research Foundation

GUIDELINE COMMITTEE

The Research Working Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Writing Committee: Professor A J Newman Taylor (Chairman), National Heart & Lung Institute & Royal Brompton Hospital; Dr P J Nicholson (Deputy Chairman), Faculty of Occupational Medicine & Society of Occupational Medicine; Mrs C Boyle (Scientific Secretary from Nov 03), Health & Safety Executive; Dr P Cullinan, National Heart & Lung Institute & Royal Brompton Hospital; Professor P S Burge, Birmingham Heartlands Hospital & Birmingham University

Ordinary Members: Mr C Beach, British Occupational Hygiene Society; Mrs C Francis (from May 04), Royal College of Nursing; Dr P F G Gannon, Society of Occupational Medicine; Dr M Levy, Royal College of General Practitioners; Mr R Miguel (from Mar 04), Trades Union Congress; Dr M J Nieuwenhuijsen, Imperial College of Science, Technology & Medicine; Dr S Ozanne, Patient representative; Dr R Rawbone, Health & Safety Executive; Mrs D Romano-Woodward, Association of Occupational Health Nurse Practitioners (UK); Dr A J Scott, British Occupational Health Research Foundation; Mr O Tudor (to Nov 03), Trades Union Congress; Dr E V Warbrick (Scientific Secretary until Nov 03), Health & Safety Executive

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [British Occupational Health Research Foundation Web site](#).

Print copies: Available from the British Occupational Health Research Foundation, 6, St. Andrew's Place, Regent's Park, London NW1 4LB.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Summary of evidence. Occupational asthma. A guide for general practitioners and practice nurses. British Occupational Health Research Foundation. London. 6 p. 2004.

Electronic copies: Available in Portable Document Format (PDF) from the [British Occupational Health Research Foundation Web site](#).

- Summary of evidence. Occupational asthma. A guide for occupational physicians and occupational health practitioners. British Occupational Health Research Foundation. London. 6 p. 2004.

Electronic copies: Available in Portable Document Format (PDF) from the [British Occupational Health Research Foundation Web site](#).

Print copies: Available from the British Occupational Health Research Foundation, 6, St. Andrew's Place, Regent's Park, London NW1 4LB.

PATIENT RESOURCES

The following is available:

- Occupational asthma. A guide for employers, workers and their representatives. British Occupational Health Research Foundation. London. 6 p. 2004.

Electronic copies: Available in Portable Document Format (PDF) from the [British Occupational Health Research Foundation Web site](#).

Print copies: Available from the British Occupational Health Research Foundation, 6, St. Andrew's Place, Regent's Park, London NW1 4LB

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

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