INSTITUTE OF OCCUPATIONAL MEDICINE

Improving health together. How health and hygiene go hand in hand.

Presented by Ross Clark

www.iom-world.org

IOM

Occupational Hygienist at IOM Consulting

Head of Workplace Protection

IOM

Supporting occupational health and wellbeing professionals

What we do

The Society of Occupational Medicine is the UK organisation for all healthcare professionals working in or with an interest in occupational health.

We are concerned with:

- the protection of the health of people in the workplace
- the prevention of occupational injuries and disease
- related environmental issues

The Chartered Society for Worker Health Protection

Everything that we do at the British Occupational Hygiene Society is guided by our mission, vision and approach;

- Our **mission** is to safeguard the UK's current and future health through the effective management of the workplace environment.
- Our **vision** is of a country where work is not a cause of acute or chronic ill-health.
- The **approach** we take in our activities is led by principle, informed by science, enabled by professionalism, and guided by good sense.

The Chartered Society for Worker Health Protection

What is an Occupational Hygienist?

Occupational hygienists help employers understand how health hazards affect the health of workers, how significant the risks may be and advise on reducing those risks by identifying suitable controls.

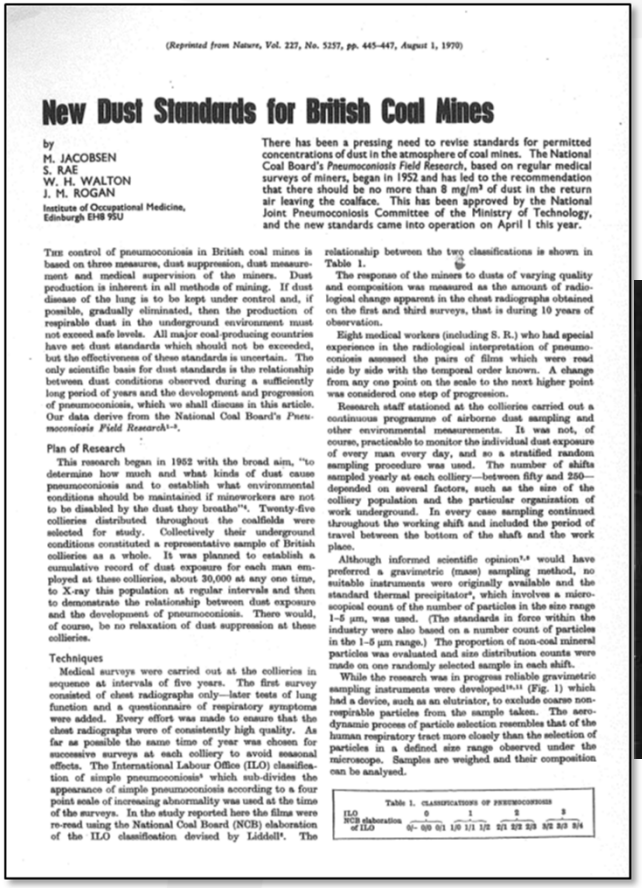
IOM

"Our purpose is to improve people's health and safety at work, at home and in the environment through excellent independent science to create a healthy and sustainable world".

The Chartered Society for Worker Health Protection

IOM


THIS COLLIERY IS NOW
MANAGED BY THE
NATIONAL
COAL BOARD
ON BEHALF OF THE PEOPLE



(Reprinted from *Nature*, Vol. 227, No. 5257, pp. 445–447, August 1, 1970)

New Dust Standards for British Coal Mines

by
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There has been a pressing need to revise standards for permitted concentrations of dust in the atmosphere of coal mines. The National Coal Board's *Pneumoconiosis Field Research*, based on regular medical surveys of miners, began in 1952 and has led to the recommendation that there should be no more than 8 mg/m³ of dust in the return air leaving the coalface. This has been approved by the National Joint Pneumoconiosis Committee of the Ministry of Technology, and the new standards came into operation on April 1 this year.

THE control of pneumoconiosis in British coal mines is based on three measures, dust suppression, dust measurement and medical supervision of the miners. Dust production is inherent in all methods of mining. If dust disease of the lung is to be kept under control and, if possible, gradually eliminated, then the production of respirable dust in the underground environment must not exceed safe levels. All major coal-producing countries have set dust standards which should not be exceeded, but the effectiveness of these standards is uncertain. The only scientific basis for dust standards is the relationship between dust conditions observed during a sufficiently long period of years and the development and progression of pneumoconiosis, which we shall discuss in this article. Our data derive from the National Coal Board's *Pneumoconiosis Field Research*[1–3].

Plan of Research

This research began in 1952 with the broad aim, "to determine how much and what kinds of dust cause pneumoconiosis and to establish what environmental conditions should be maintained if mineworkers are not to be disabled by the dust they breathe"[4]. Twenty-five collieries distributed throughout the coalfields were selected for study. Collectively their underground conditions constituted a representative sample of British collieries as a whole. It was planned to establish a cumulative record of dust exposure for each man employed at these collieries, about 30,000 at any one time, to X-ray this population at regular intervals and then to demonstrate the relationship between dust exposure and the development of pneumoconiosis. There would, of course, be no relaxation of dust suppression at these collieries.

Techniques

Medical surveys were carried out at the collieries in sequence at intervals of five years. The first survey consisted of chest radiographs only—later tests of lung function and a questionnaire of respiratory symptoms were added. Every effort was made to ensure that the chest radiographs were of consistently high quality. As far as possible the same time of year was chosen for successive surveys at each colliery to avoid seasonal effects. The International Labour Office (ILO) classification of simple pneumoconiosis[5] which sub-divides the appearance of simple pneumoconiosis according to a four point scale of increasing abnormality was used at the time of the surveys. In the study reported here the films were re-read using the National Coal Board (NCB) elaboration of the ILO classification devised by Liddell[6]. The relationship between the two classifications is shown in Table 1.

The response of the miners to dusts of varying quality and composition was measured as the amount of radiological change apparent in the chest radiographs obtained on the first and third surveys, that is during 10 years of observation.

Eight medical workers (including S. R.) who had special experience in the radiological interpretation of pneumoconiosis assessed the pairs of films which were read side by side with the temporal order known. A change from any one point on the scale to the next higher point was considered one step of progression.

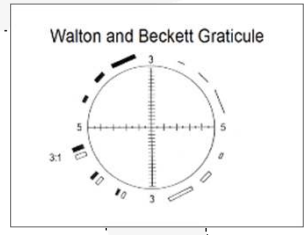
Research staff stationed at the collieries carried out a continuous programme of airborne dust sampling and other environmental measurements. It was not, of course, practicable to monitor the individual dust exposure of every man every day, and so a stratified random sampling procedure was used. The number of shifts sampled yearly at each colliery—between fifty and 250—depended on several factors, such as the size of the colliery population and the particular organization of work underground. In every case sampling continued throughout the working shift and included the period of travel between the bottom of the shafts and the work place.

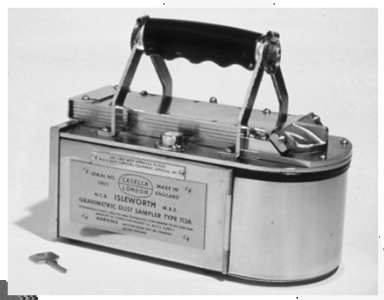
Although informed scientific opinion[7,8] would have preferred a gravimetric (mass) sampling method, no suitable instruments were originally available and the standard thermal precipitator[9], which involves a microscopical count of the number of particles in the size range 1–5 μm, was used. (The standards in force within the industry were also based on a number count of particles in the 1–5 μm range.) The proportion of non-coal mineral particles was evaluated and size distribution counts were made on one randomly selected sample in each shift.

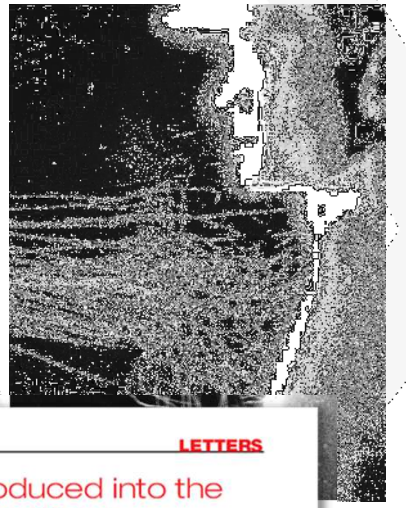
While the research was in progress reliable gravimetric sampling instruments were developed[10,11] (Fig. 1) which had a device, such as an elutriator, to exclude coarse non-respirable particles from the sample taken. The aerodynamic process of particle selection resembles that of the human respiratory tract more closely than the selection of particles in a defined size range observed under the microscope. Samples are weighed and their composition can be analysed.

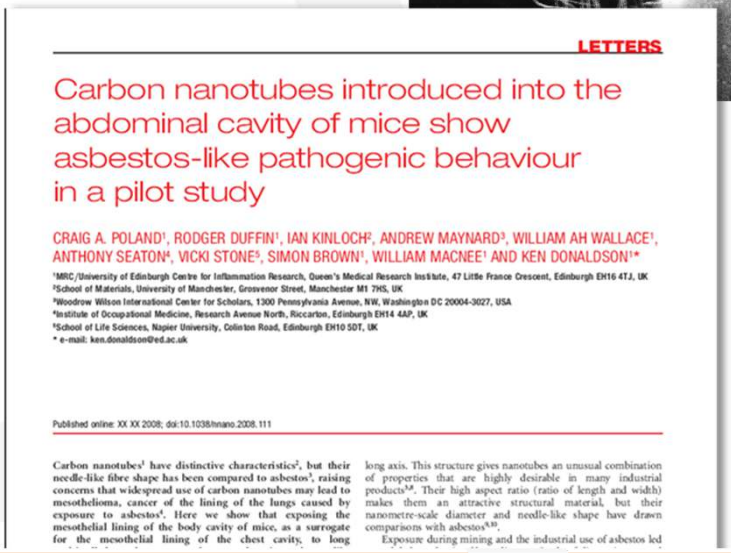
Table 1. CLASSIFICATIONS OF PNEUMOCONIOSIS

ILO	0	1	2	3
NCB elaboration of ILO	0/- 0/0 0/1	1/0 1/1 1/2	2/1 2/2 2/3	3/2 3/3 3/4









LETTERS

Carbon nanotubes introduced into the abdominal cavity of mice show asbestos-like pathogenic behaviour in a pilot study

CRAIG A. POLAND[1], RODGER DUFFIN[1], IAN KINLOCH[2], ANDREW MAYNARD[3], WILLIAM AH WALLACE[1], ANTHONY SEATON[4], VICKI STONE[5], SIMON BROWN[1], WILLIAM MACNEE[1] AND KEN DONALDSON[1]*

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Carbon nanotubes[1] have distinctive characteristics[2], but their needle-like fibre shape has been compared to asbestos[3], raising concerns that widespread use of carbon nanotubes may lead to mesothelioma, cancer of the lining of the lungs caused by exposure to asbestos[4]. Here we show that exposing the mesothelial lining of the body cavity of mice, as a surrogate for the mesothelial lining of the chest cavity, to long long axis. This structure gives nanotubes an unusual combination of properties that are highly desirable in many industrial products[5,6]. Their high aspect ratio (ratio of length and width) makes them an attractive structural material, but their nanometre-scale diameter and needle-like shape have drawn comparisons with asbestos[4,10].

Exposure during mining and the industrial use of asbestos led

Pneumoconiosis Field Research - Understanding the causes of lung disease in coal workers

IOM's founding purpose was to understand the causes of lung disease in coal workers and provide the evidence for safe working limits to eliminate them. Through the Pneumoconiosis Field Research programme, IOM's research investigated the relationship between coalmine dust and the health of miners' lungs, in a study monitoring over 50,000 miners in Britain.

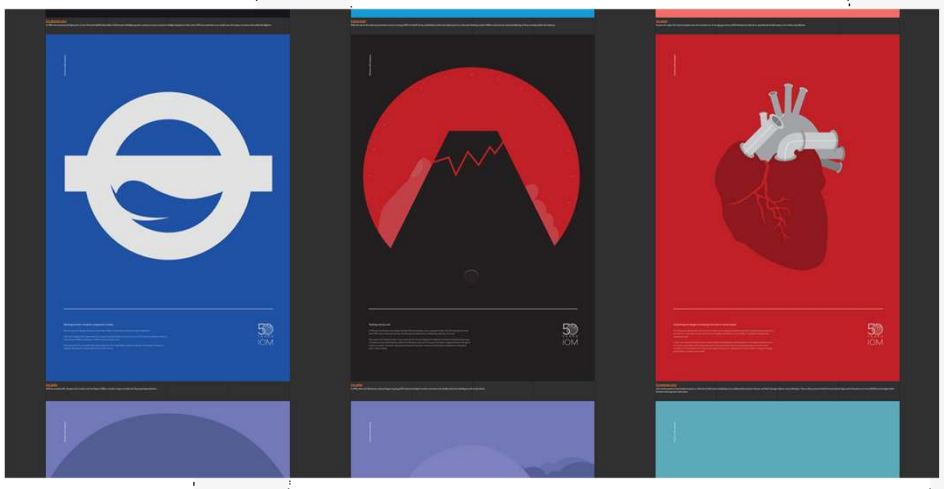
The study had significant impact within both the industry and government, drastically improving working standards and contributing to the reduced risk of the disease globally. Additionally, based on the evidence collected, a scheme was established which provided compensation for hundreds of thousands of miners and their families for the health effects caused from working in such terrible conditions.

Design Rational

With the impact highlighting lung disease within coal miners, the poster shows a small depiction of a miner using a pick hammer to chip away internally at a set of lungs like they would if underground with coal.

www.iom-world.org/iom-50/

www.iom-world.org/iom-50/

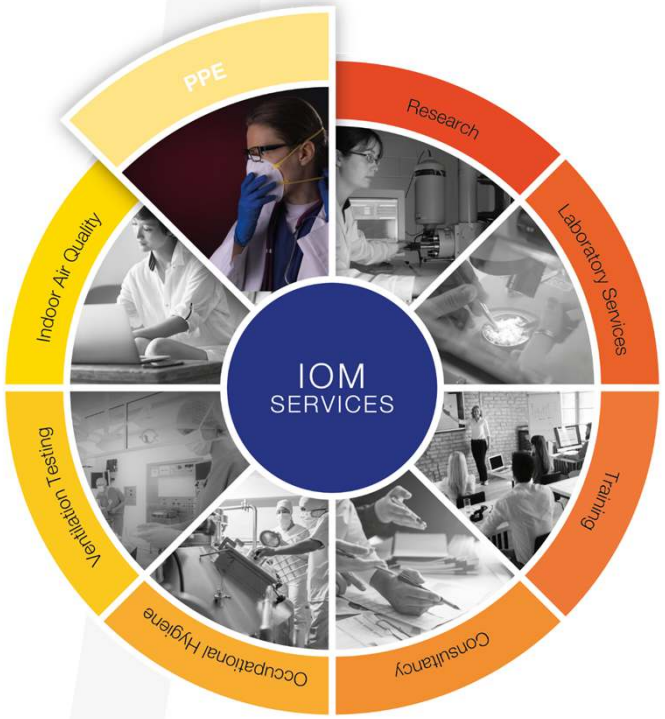


Occupational Hygiene

A national team of experts providing:

- Quantification of Hazards
- In person and remote sampling
- Measurement of chemical, physical and biological agents

PPE



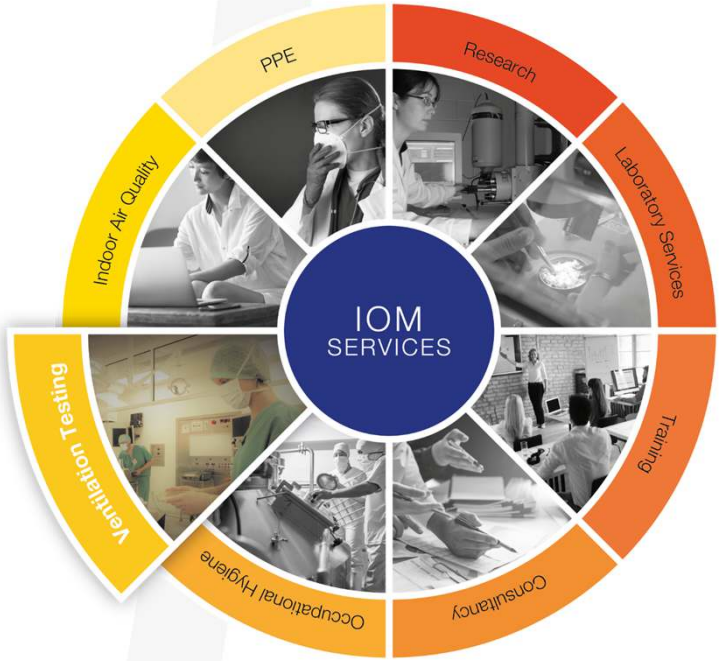
Understanding how effective PPE will be against different exposures

Thorough testing of Chemical Suits for manufactures

Respirator Face Fit Testing

fit2fit ACCREDITED RPE Fit Test Provider

Ventilation Testing



Verifications and Validations of hospital operating theatres and critical areas.

Authorising Engineers – Ventilation

LEV Testing

In a hurry but have questions for us?

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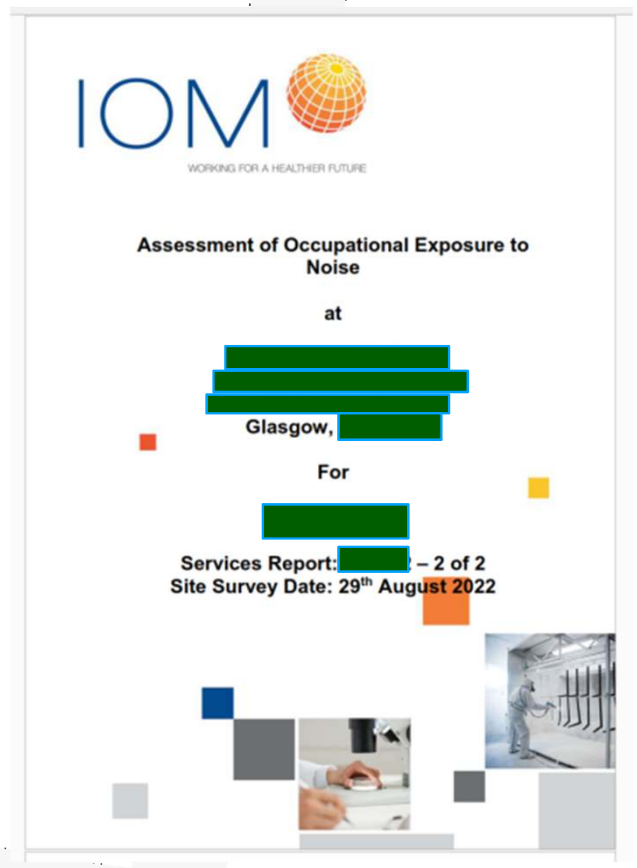
Or contact us at info@iom-world.org


IOM
WORKING FOR A HEALTHIER FUTURE
Assessment of Occupational Exposure to Noise
at
[redacted]
Glasgow, [redacted]
For
[redacted]
Services Report: [redacted] – 2 of 2
Site Survey Date: 29th August 2022

Noise:

The regulations also require that employees are placed under suitable health surveillance, including testing of their hearing if the risk assessment indicates that there is a risk to health.

4.3 OTHER OBSERVATIONS

There is a current annual health surveillance programme in operation for the operators. Health surveillance checks include hearing tests, lung function and eye tests.

6 CONCLUSIONS

Personal noise exposures was measured on four individuals to determine their daily personal noise exposure (LEP,d) giving the average noise levels over the working shift.

The operators exposure ranged from 81 to 86B(A) with only one measurement above the 85dB(A) upper exposure action value (UEAV).

APPENDIX 2: HEALTH EFFECTS

Most workers exposed to noise suffer temporary hearing damage, becoming more severe with prolonged exposure, whether intermittent or continuous. Such energy transmission, if sufficiently prolonged and intense, will damage the inner mechanisms of the ear and can eventually lead to permanent deafness or presbycusis.

Alternatively, employees may develop noise-induced hearing loss. The ear's ability to hear sound at around 4 kHz becomes considerably diminished, and over time this extends over the range 3 – 6 KHz. These are the frequencies around which speech is centred, and presbycusis has the specific effect of removing the sibilant consonants. The end result is the hearer's loss of appreciation of the spoken word.

Where employees are likely to be exposed regularly to noise levels above the upper exposure action values health surveillance must be provided. Such surveillance must also be provided for any persons who are at an increased risk; e.g. existing hearing loss, sensitive to damage.

Advice should be sought from an appropriate health professional before the introduction of a health surveillance programme. The programme will normally include the following:

- Regular hearing checks;
- Provision of information to employees; and
- Health records.

The purpose of the health surveillance is to:

- Give warning of early signs of hearing damage;
- Provide the opportunity to prevent damage getting worse; and
- Check that control measures are working.

IOM

WORKING FOR A HEALTHIER FUTURE

Assessment of Occupational Exposure to Respirable Dust and Respirable Crystalline Silica

at

Respirable Crystalline Silica:

respirator.

- The employees are exposed, or are liable to be exposed, to a hazardous substance and must be placed under a suitable health surveillance programme. The results of this survey should be discussed with the occupational health provider.
- The operators should be reminded of the health risks associated with stone dust and quartz (crystalline silica), use of control measures, use of RPE/PPE, safe working procedures, emergency procedures, and health surveillance and hygiene facilities on a regular basis.

4.5 HEALTH SURVEILLANCE

All the staff are subject to annual health surveillance testing that includes lung function tests and audiometry tests.

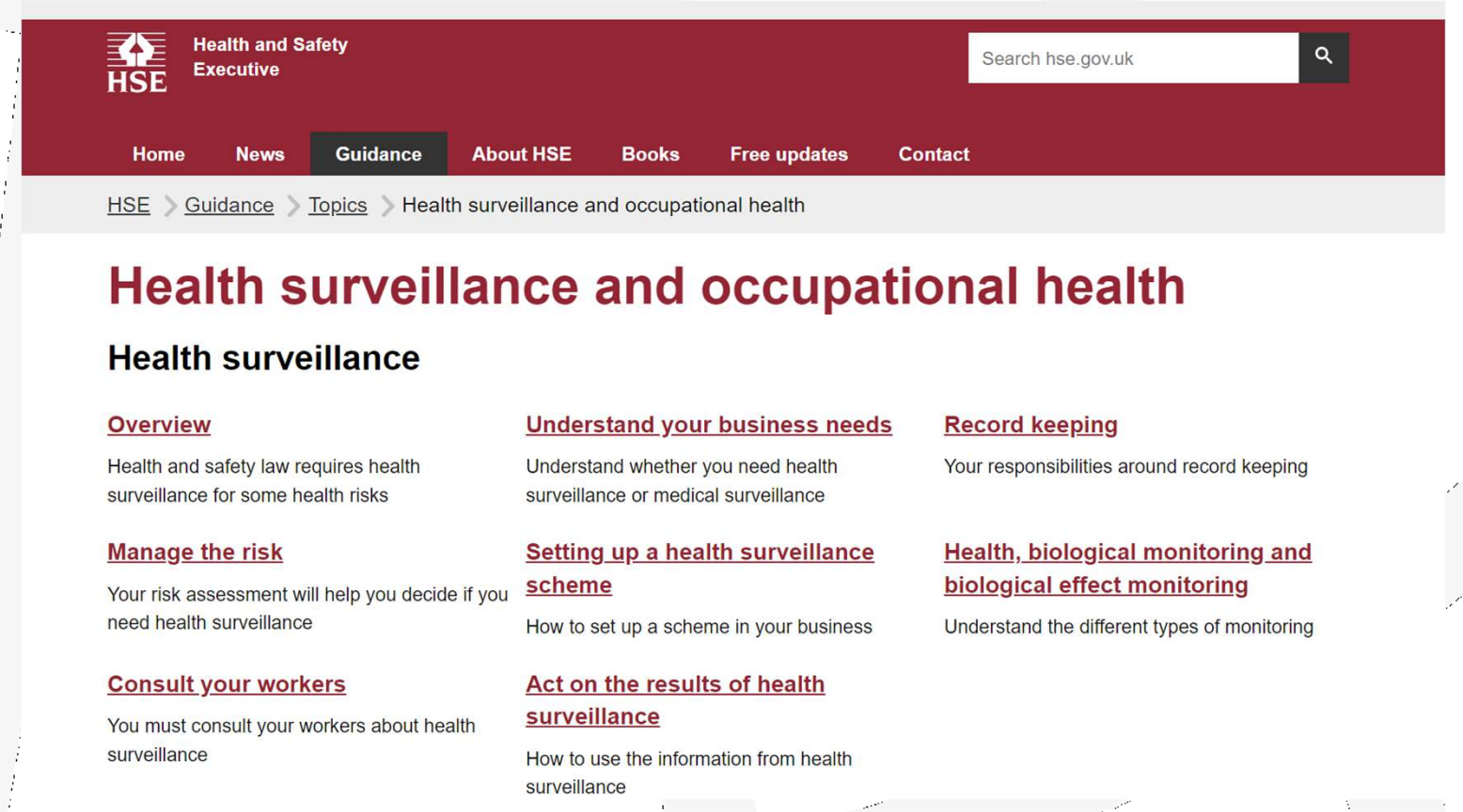
Isocyanates:

- Share the results from this survey with the occupational health provider.
- Commence the provision of health surveillance to all those potentially exposed to isocyanates and other harmful substances.

Monitor: You may need to do health surveillance if there is a reasonable likelihood of getting dermatitis from your work. It could be done by a 'responsible person'. This can be an employee with suitable training. They should:

- assess the condition of a new worker's skin before, or as soon as possible after, they start work and then periodically check for early signs of skin disease after this
- keep secure health records of these checks
- tell the employer the outcome of these checks and any action needed

A competent person should perform annual lung function testing and a questionnaire (PDF) for asthma if your work involves generating aerosols containing isocyanates.



Health and Safety Executive

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Health surveillance and occupational health

Health surveillance

Overview

Health and safety law requires health surveillance for some health risks

Manage the risk

Your risk assessment will help you decide if you need health surveillance

Consult your workers

You must consult your workers about health surveillance

Understand your business needs

Understand whether you need health surveillance or medical surveillance

Setting up a health surveillance scheme

How to set up a scheme in your business

Act on the results of health surveillance

How to use the information from health surveillance

Record keeping

Your responsibilities around record keeping

Health, biological monitoring and biological effect monitoring

Understand the different types of monitoring

Where do those reports go?

Problem:

How do you connect Occupational Health with Occupational Hygiene?

Solutions:

- Understanding of roles and capabilities
- Collaboration

Call to arms:

Speak to an Occupational Hygienist and make connections.

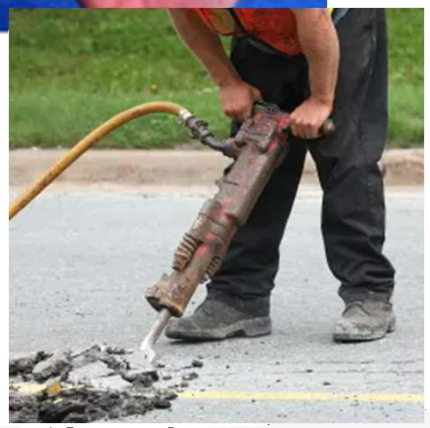
Work together.

Help your clients and your patients by directing them to Hygienists (and vice versa).

Laboratory Animal Allergens and other sensitisers:

Noise Reduction:

HAVS



Health and Safety Executive

8 Questions about Vibration Exposure Monitoring

HSE inspectors commonly come across companies that are engaged in routine continual monitoring or logging of workers' hand-arm vibration exposure (eg using log books, in-line electrical or pneumatic timers or more sophisticated electronic timers and wearable timers). The following Q&A for employers addresses why HSE advises that such monitoring is unlikely to be necessary.

1) Must I continually monitor workers' exposure to vibration?

No. There is no legal requirement for **continual** monitoring and recording of vibration exposure. To do so is probably not a good use of your or your employees' time, unless there are very specific circumstances (see below).

What you must do is decide what workers' exposure is likely to be, as part of a vibration risk assessment. So a period of monitoring to understand how long workers use particular tools in a typical day or week may be necessary – if it helps you to do your risk assessment. Once you know enough about the work to say what the exposure is likely to be (and whether it is likely to exceed either the Exposure Action or Exposure Limit Value) your focus can shift to investigating, and taking, practical steps to reduce the exposure and the risks.

2) So I've stopped continual monitoring. Now what?

It's likely that you can put your monitoring data to some use. It may give you enough information to decide what individuals or groups of workers are at risk from vibration, either routinely or on an intermittent basis. Please refer to webpage www.hse.gov.uk/vibration for guidance. Take positive action to reduce the exposure and the risks – eg change the work process to avoid the need to use hand tools, modify the work to improve ergonomics, change to better tools with lower vibration and good ergonomic design, maintain and look after the tools and consumables and train your workers. Make sure the action you take results in real changes – monitor your systems and make sure work instructions are being followed. Don't forget health surveillance for workers at risk, to pick up early signs of ill-health.

Dust, fumes, gases and vapours:

Scan the QR code, to get in touch.

Or contact us at info@iom-world.org

We can give you the gift of a 15 minute consultation to discuss Occupational Hygiene.

Now: what would you like an Occupational Hygienist to do to help you?

IOM