POCKET CONSULTANT

Occupational Health

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FIFTH EDITION
Occupational Health
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Foreword

This pocket consultant started out as what was often referred to popularly as ‘Harrington and Gill’. Since then, it has undergone several revisions, and it has become the best selling compact primer for occupational health in the UK. It is used by many multidisciplinary groups of occupational health practitioners (including nurses, doctors, safety professionals), and as a standard text for several occupational health courses.

We are delighted to present the 5th edition. The concise nature of the presentation, with short sections and bullet points has been retained. We have created a new chapter on occupational toxicology, updated the chapters on occupational health law and on sources of information, and added new material on emerging infections relevant to occupational health practice. The section on psychosocial aspects has been expanded, and the section on vibration rewritten to take on board new HSE (Health and Safety Executive) information on the subject. The findings of recent evidence-based reviews on several topics including vibration and low back pain have been included.

We would especially like to thank our readers, students, and colleagues from within and outside the UK, for taking the time to make useful suggestions, to clarify some points, to correct a few errors, and to improve the text. Our thanks also to those who contributed material for this new edition, and to those who reviewed the sections. We hope the book continues to be a ready, quick reference for occupational health practitioners.

Tar-Ching Aw, Kerry Gardiner and Malcolm Harrington
Canterbury, 2006
1 Introduction

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1 Introduction

1.1 What is occupational health?

Occupational health is a multifaceted and multidisciplinary activity concerned with the prevention of ill health in employed populations. This involves a consideration of the two-way relationship between work and health. It is as much related to the effects of the working environment on the health of workers as to the influence of the workers’ state of health on their ability to perform the tasks for which they were employed. Its main aim is to prevent, rather than cure, ill health from wherever it arises in the workplace.

A joint International Labour Organization/World Health Organization (ILO/WHO) Committee defined the subject back in 1950 as: ‘the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations’.

The relationship between the worker and the world of work is, necessarily, complex (Fig. 1.1). The worker brings to the place of work a pre-existent health status influenced by many factors—only some of which are under the workers’ direct control. Any illness that occurs in the employed worker has to be viewed in this context. The health outcome could be caused by work, modulated by work or unrelated to it. Such a view of occupational health is, however, predominantly a medical model. The situation is much more complex nowadays.

1.2 Who is involved in occupational health?

Traditionally, occupational health has been viewed as a clinical subject, implying that the dominant roles in prevention should be played by the physician and the nurse. The ILO/WHO definition from nearly half a century ago suggests that a broader view is necessary.

Thus, the list of relevant professionals is extensive and includes:

- physicians;
- nurses;
- occupational hygienists;
- sociologists;
- toxicologists;
- psychologists;
- health physicists;
- microbiologists;
- epidemiologists;
- ergonomists;
Fig. 1.1 The problems facing the practitioner attempting to establish a link between work and health. The new employee brings a legacy of genetic, social, dietary and environmental factors affecting health to the new workplace, which may influence his or her response to workplace hazards.
1 Introduction
1.3 The world of work

• safety engineers;
• work organisation experts;
• lawyers.

Yet, the ultimate responsibility for maintaining the health of the workforce rests with the employer, and, to a lesser extent, with the employee. This is the way most health and safety law is formulated. On the basis of this model, one can begin to view those involved as an even broader group. The ‘stakeholders’ would thus include a number of groups who, although they may not be professionally responsible for ensuring the wellbeing of the workers, do have a crucial interest in the outcome (Fig. 1.2).

1.3 The world of work

The changing patterns of employment in world industry will have important implications for the future style and thrust of occupational health, as well as for the competence needed to deliver the goods. Across the world, the days of full-time, long-term employment in one industry for a worker with one set of skills are rapidly disappearing. The main features for the future seem to be:
• fragmented industry;
• smaller workforces;
• more mobile employees;
• multi-skilled workers;
• greater use of subcontracted tasks;
• less job stability;
• less job security;
• more part-time work;
• more flexible hours of work;
• more mechanised (and therefore possibly more dehumanised) workplaces.
1.4 The world of people at work

Today, certainly in the developing world, occupational physicians see more illness but less disease. Whilst musculoskeletal disorders and stress-related complaints dominate the scene, they too are interrelated and both are subject to ‘somatising tendencies’ (presenting as physical symptoms related to different target organ systems). Thus, the new ‘age of existentialism’ is dominated by such conditions as:

• stress;
• non-specific effect modifiers;
• post-traumatic stress disorder;
• chronic fatigue syndrome;
• multiple chemical sensitivity;
• diffuse pain syndromes;
• a combination of psychological, neurological, and immunological issues.

1.5 The roles of the occupational health professional

In developed countries, many of the older occupational diseases have been controlled—or, at least, the means for controlling them are known. In such settings, the delivery of an effective occupational health service to employed people will become more complex and more difficult in the future—although with greater emphasis on control, there should be less to do in dealing with the injured or sick. These, after all, represent the ‘failings’ of an effective preventive programme.

Moreover, the influences of the stakeholder and the complexities of the employment scene have shifted the traditional emphasis away from the structure of ‘see the health effect, diagnose the illness, find the cause’ to the more proactive stance of ‘control the exposure and monitor the effects’. In this model, the roles of the safety engineer and the occupational hygienist become more central, and now sit alongside the clinical aspects rather than being secondary to them. One further aspect of occupational health services is worth mentioning: in the market economies, there has been a shift towards demonstrating to employers the economic value to them of such a service. A UK Faculty of Occupational Medicine brochure listed the ways in which occupational physicians can help the employer to ‘meet their obligations’ under European health and safety legislation. These included:

• helping with company compliance with the law;
• advising on health and safety policy;
• assisting in the control of sickness absence;
• reviewing the fitness of employees’ post-sickness absence;
• managing rehabilitation;
• advising on fitness to work;
• managing access to first aid services;
• organising health promotion initiatives;
• designing and managing substance abuse programmes at work;
• advising on the management and alleviation of stress;
• advising employees about overseas travel on company business;
• assessing employees’ eligibility for long-term disability benefits or retirement on health grounds.

The order of these functions is probably not random, and many might dispute the contents of this list and certainly the order. Nevertheless, it demonstrates the move...
towards delivering an economically attractive package to the employer. Whether this is what the employee needs is another matter. Indeed, one can dispute whether this medical model has real validity for the twenty-first century.

In developing countries, an occupational health service often starts with the provision of medical care for the workforce (akin to a general practice at the worksite, and often with provision for the workers’ dependants) (see Chapter 2). In the newly emerging countries of Eastern Europe, the ‘prophylactic’ medical examination remains at the heart of the health-care system in the workplace. Even in Poland, which is among the more advanced of this group of countries, their 1997 Occupational Health Services Act places medical examinations at the core of service activities. Recent updates of the legislation have tended, however, to stress the importance of the preventive role of the medical input.

Many of these functions are often performed by an occupational health nurse, who frequently works in isolation from any form of direct medical advice. Both physicians and nurses, however, have to be aware of their clinical limitations (either by training or by the fact that the employee is another physician’s patient), and both also must see the workplace in the context of what goes on at the worksite (see Section 1.6).

Such a knowledge of the workplace activity and process is a central feature of the work of the occupational hygienist, the ergonomist, and the expert in work organisation. These professionals are in short supply, and few businesses employ their own. Yet, their role is to recognise and understand the complexities of the work process, the nature of the materials used, produced, and disposed of and the methods of production. In addition, the hygienist is an expert in identifying the sources and measuring the concentrations and emissions of workplace contaminants to ensure that appropriate controls can be put in place.

The investigation of a putative link between a hazard and health effect requires a study of the populations exposed (a task for the epidemiologist), as well as a knowledge of the toxicological effects (a task for the toxicologist) with the necessary accompaniment of a risk assessment (a task for the occupational health and safety professional with experience in risk management).

Safety is often considered separately from health. This is inappropriate and counterproductive to the development and execution of an integrated health and safety strategy to protect health in the workplace. The key functions of safety management are:

- policy and planning—determining safety goals and a plan of work to achieve these goals;
- the provision of a clear basis of responsibility and communication to achieve control;
- the identification and assessment of risks and the control measures necessary to counter such risks;
- the monitoring and review of these policies and practices.

While safety engineers tend to concentrate on the mechanical aspects of the workplace process, a similar structure of activity and function could be established for all occupational health professionals.

Who does what then comes down to the resources available to the employer, as well as the hazards and risks inherent in the process. As industry becomes more fragmented, the large, company-financed, multidisciplinary teams will disappear as well. The role of independent consultant advisers will then come to the fore, but the integrated activity of several professional groups working together to achieve long-term goals could be lost. In this context, the corporate control of the company may need to take the coordinating role.
1 Introduction
1.6 Industrial processes and health outcomes

Every professional providing occupational health advice and service must ensure that they have had the relevant training by the professional bodies of their specialty which are responsible for overseeing competence. Training and education schemes are available for the main groups listed in Section 1.2 above. Furthermore, many of these bodies now insist upon programmes of continuing professional development for the career lifetime after successful completion of the examinations for competence.

1.6 Industrial processes and health outcomes

Although there has been a dramatic rise in service industries in most developed countries, manufacturing industries remain a vital part of the economy. These industries, together with the extractive process and power generation enterprises, remain the main source of concern regarding workplace exposures leading to ill health and injury.

The main industries and their health effects are summarised in Table 1.1.

Whatever the workplace activity and whoever is responsible for managing health and safety, the means of protecting the workforce can be summarised as:

• hazard identification;
• risk assessment;
• management intervention;
• control procedures;
• review and audit effectiveness.

1.7 Summary

The health of the employee at a place of work is the concern of many professional groups. There is a need to identify hazards be they physical, chemical, biological or psychosocial. Once identified, the risks to the workforce must be assessed and measures to control these risks must be instituted. Measuring the effectiveness of this process involves the monitoring of the workplace environment and the health status of the employees. Auditing the effectiveness of these measures and improving the control are never-ending processes.

The bottom line remains the health of the worker. This is what both the workers and employers desire—a healthy workforce at work. It follows that the culture of good health and safety policy and practice must pass from the professionals—and the management—to the workforce. When everyone at the workplace believes that such policies and practice are part of their responsibility, occupational health can be considered to have achieved its main goal.

1.8 The future

Such an ideal of the total ‘ownership’ of health and safety by all, managers and managed alike, may be some time distant—if it is achieved at all. Nevertheless, occupational health professionals need to be looking for the newer emphases that will emerge in the next decade, as these will influence the content and style of their work. Apart from the shifts in workforce size, skills, and structure mentioned in Section 1.3, several other influences are now beginning to emerge, which could necessitate yet more shifts
Table 1.1 Industrial processes and potential occupational health exposures. Industrial processes release hazardous substances and physical agents which can cause ill health to the operators if encountered in sufficiently large doses. Substances that can be inhaled will appear in the form of dusts, fibres, fumes, mists, micro-organisms, gases, and vapours. Those that come into contact with the skin will be liquid or particulate. Substances can also be ingested or inoculated. Hazardous agents take the form of emissions of noise, heat, barometric pressure, electromagnetic waves, and ionising particles which target one or more organs. The table lists some of these in relation to industry or occupation.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Substances encountered (mainly chemical hazards)</th>
<th>Other agents (mainly physical hazards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractive</td>
<td>Siliceous rock—fine crystalline silica dusts, radon, after gases from explosives, exhaust emissions from underground transport and machinery, carbon monoxide (CO), oxides of nitrogen (NOₓ)</td>
<td>Noise, ionising radiation, heat, lack of light</td>
</tr>
<tr>
<td>Mining and quarrying of basic raw materials</td>
<td>Crushed ores, metal fumes, sulphur dioxide (SO₂), arsine</td>
<td>Noise, heat, electromagnetic fields (EMFs)</td>
</tr>
<tr>
<td>Refining of the mineral</td>
<td>Coal dust, radon, drilling muds, petrochemicals, CO</td>
<td>Noise, heat, lack of light, high barometric pressure</td>
</tr>
<tr>
<td>Refining fossil fuels</td>
<td>Dust, SO₂, other gases dependent upon process, solvents, metallic catalysts, petrochemical vapours</td>
<td>Noise, heat, ionising radiation</td>
</tr>
<tr>
<td>Extracting fossil fuels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Metal fumes, CO, dust</td>
<td>Noise, heat, EMFs</td>
</tr>
<tr>
<td>Metal smelting</td>
<td>Silica dust, metal fumes, metal fumes, CO, phenols, ammonia</td>
<td>Noise, heat, EMFs</td>
</tr>
<tr>
<td>Founding/forging</td>
<td>Vinyl chloride, solvent vapours</td>
<td>Noise, heat</td>
</tr>
<tr>
<td>Plastics</td>
<td>Welding fumes, resin vapours, isocyanates, grinding dusts</td>
<td>Noise</td>
</tr>
<tr>
<td>Fabrication</td>
<td>Solvent vapours, isocyanates, acid mists, metal grinding dusts</td>
<td>Noise</td>
</tr>
<tr>
<td>Finishing</td>
<td>Wood dust, fungicides, phenol-formaldehyde resin</td>
<td>Noise</td>
</tr>
<tr>
<td>Woodworking</td>
<td>Solvent vapours, wood dust, biocides, fungicides</td>
<td>Noise</td>
</tr>
<tr>
<td>Wood finishing</td>
<td>Soldering, brazing and welding fumes, adhesive solvent vapours, cutting oils, acids, alkalis</td>
<td>Noise, heat</td>
</tr>
<tr>
<td>General assembly</td>
<td>Silica dust, dyes, glazes</td>
<td>Heat</td>
</tr>
<tr>
<td>Pottery and ceramics</td>
<td>Solvent vapours, photographic chemicals, acrylates</td>
<td>Noise</td>
</tr>
<tr>
<td>Printing</td>
<td>Fibres, dyes, mordants, adhesive and stain solvents</td>
<td>Noise</td>
</tr>
<tr>
<td>Textiles and clothing</td>
<td>Dusts, vapours, intermediate products, fugitive emissions</td>
<td>Noise, heat, non-ionising radiation</td>
</tr>
<tr>
<td>Transfer of materials and process heating</td>
<td>Soldering, brazing and welding fumes, adhesive solvent vapours, cutting oils, lead, acids, alkalis</td>
<td>Noise, heat, non-ionising radiation</td>
</tr>
<tr>
<td>Transport manufacture (road, rail, sea, air)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# 1 Introduction

1.8 The future

<table>
<thead>
<tr>
<th>Industry</th>
<th>Substances encountered (mainly chemical hazards)</th>
<th>Other agents (mainly physical hazards)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug manufacture</td>
<td>Active drug dusts and liquids, aerosol propellants, micro-organisms, food dusts</td>
<td>Cold, noise, ionising and non-ionising radiation</td>
</tr>
<tr>
<td>Hospitals</td>
<td>Micro-organisms, sterilisers, e.g. glutaraldehyde, detergents, preservatives, vaccines, anaesthetic gases, methyl methacrylate</td>
<td>Noise, ultrasound, ionising and non-ionising radiation</td>
</tr>
<tr>
<td>Community</td>
<td>Micro-organisms, pesticides, fungicides</td>
<td></td>
</tr>
<tr>
<td><strong>Research and quality control</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratory work</td>
<td>Solvents, contact with chemicals, micro-organisms, animal dusts, metals, rock dusts</td>
<td>Ionising radiation</td>
</tr>
<tr>
<td><strong>Food manufacture, preparation and sales</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milling</td>
<td>Flour and grain dusts</td>
<td>Noise</td>
</tr>
<tr>
<td>Baking</td>
<td>Flour, cocoa and spice dusts</td>
<td>Heat</td>
</tr>
<tr>
<td>Milk products and fermentation</td>
<td>Protein dust, yeast spores, carbon dioxide (CO$_2$)</td>
<td>Heat and cold</td>
</tr>
<tr>
<td>Food preparation, storage, distribution and sales</td>
<td>Food dusts, vehicle exhaust gases</td>
<td>Heat, cold, and extreme cold</td>
</tr>
<tr>
<td><strong>Maintenance and repair</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery and transport</td>
<td>Exhaust gases, solvents, welding, brazing and soldering fumes, grinding dusts, fuels, acids, alkalis</td>
<td>Noise, heat, cold, ionising radiation</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building and surface works</td>
<td>Cement dust, rock dusts, resin vapours, welding fumes, fibres, paint and adhesive solvent vapours</td>
<td>Noise, cold or heat (geography-dependent)</td>
</tr>
<tr>
<td>Tunnelling</td>
<td>Rock dusts, resin vapours, explosive fumes, diesel fumes</td>
<td>Noise, heat, cold, high barometric pressure</td>
</tr>
<tr>
<td>Demolition</td>
<td>Welding fumes, surface coating vapours, asbestos and other fibres</td>
<td>Noise, cold or heat (geography-dependent)</td>
</tr>
<tr>
<td><strong>Heat and power generation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burning of fuel</td>
<td>Coal, silica and ash dust, CO, SO$_2$, vanadium, fumes of combustion, tar vapours</td>
<td>Noise, heat</td>
</tr>
<tr>
<td>Nuclear generation</td>
<td>Alpha ($\alpha$) and beta ($\beta$) particles</td>
<td>Ionising radiation, heat, noise</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arable farming</td>
<td>Pesticides, herbicides, grain dust</td>
<td>Noise, heat, cold</td>
</tr>
<tr>
<td>Animal farming and veterinary work</td>
<td>Animal micro-organisms, vaccines, pesticides, organic dusts, e.g. animal dander</td>
<td>Noise, heat, cold</td>
</tr>
<tr>
<td>Horticulture</td>
<td>Fungicides, pesticides, herbicides</td>
<td>Noise, heat, cold</td>
</tr>
</tbody>
</table>
in the job content of the occupational health practitioner. These are some to start thinking about:
• public safety/consumer protection;
• public risk perceptions (and effective public risk communication);
• environmental impact of workplace process;
• leisure industry risks.
  
  Finally, that which is probably destined to dominate our professional lives in the twenty-first century:
• PSYCHOSOCIAL HEALTH.
2 Occupational Health Services—an International Perspective

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2.4 Developed countries 17

2.5 From clinical care to health promotion 19

2.6 Occupational health services 19
   Clinical occupational health activities; Workplace assessments;
   General advice and support; Other activities
2.1 Delivery of occupational health services

Different models exist for the provision of occupational health in various countries, with the differences lying in the mix of occupational health professionals that make up the occupational health team, the range of services that they provide, the legislative requirements and framework and the perceived needs by workers and their employers. Some of the legislative and preventive activities are performed by government departments, whereas the provision of occupational health services for groups of workers is often organised by employers. The training of occupational health professionals is usually offered by academic centres or training institutes.

An important difference between countries lies in the method used to pay for occupational health services. For those countries where there is an insurance based ‘workers’ compensation’ system in place, or national legislation that requires employers to ensure that workers have access to an occupational health service, the services are often not provided by an in-house service directly connected with the company, but provided by a commercial provider from a remote site. The range of services that can be provided in these systems is often clearly defined, but restricted to what the insurance system allows or national legislation requires the employer to provide. In these types of systems occupational health services often enjoy a degree of independence from the employer, but may have more limited influence over workplace conditions than in other systems. In those countries where the occupational health services are paid for directly by the employer—either via an in-house service based on the company premises, or purchased from an external supplier—there is the potential for services to be provided that are restricted only to what the employer wishes to purchase for or provide to their staff. However, an in-house service working closely with the employer may be in the best position to identify workplace risks and influence the employer to improve working conditions in a more proactive manner.

2.2 Developing countries

In many developing countries, such as in parts of Africa, South America and Asia, occupational health is provided as part of the general medical care for the workforce. In-house medical services are usually only available for larger companies, especially those belonging to multinational organisations. Larger companies employ more workers, have the resources to provide medical facilities for their workforce and often have occupational health policies and standards which apply to all their member companies world-wide. For developing countries, this model often places emphasis on the treatment of illnesses, whether occupational or non-occupational in origin, with fewer resources for occupational health prevention. Some companies even have their own private clinics and hospitals to care for local workers and their families. These clinical facilities also cater for the medical needs of the overseas expatriate staff and their families. One reason why companies often concentrate on treatment services is the limited availability and access to medical facilities in these countries. Another is the
2 Occupational Health Services—an International Perspective

2.3 Rapidly industrialising countries, for example Malaysia

The developments in occupational health in Malaysia can be used as an example of how occupational health services may be provided in an industrialising country. In Malaysia, the Workers and Environmental Health Unit of the Ministry of Health is a central government source of advice and information, with satellite government occupational health clinics being planned for different parts of the country. The Department of Occupational Safety and Health of the Ministry of Human Resources enforces occupational health and safety legislation. Much of this legislation has been derived from similar UK laws. A National Institute of Occupational Safety and Health has been established to provide training. General practitioners with an interest in occupational health have been appointed by the Malaysian Social Security Organisation (SOCSO) to evaluate and forward claims for compensating occupational diseases. There are several avenues for training physicians in occupational medicine. These include local academic institutions and training establishments in other countries, such as Australia and Ireland. However, occupational health nursing and occupational hygiene training lag behind. In the private sector, some general practitioners provide clinical cover for factory workers through contracts with employers. The emphasis is on treatment, pre-employment assessments, sickness absence issues and return to work, with fewer opportunities for occupational hygiene assessments or preventive activities at the workplace. With the development of notification schemes for
occupational diseases, and the agreement of uniform criteria for diagnosing such diseases, the preventive aspects of occupational health services will have greater emphasis in the future.

2.4 Developed countries

Many developed countries have a legal requirement for the provision of occupational health services. The situation in Europe varies from country to country, although there have been attempts by the administration of the European Union (EU) to harmonise occupational exposure standards and requirements for occupational health provisions. Its approach has been to specify minimum standards for compliance by EU member states, but to allow higher standards to be promulgated by individual states if they wish. The EU has also established a European Agency for Health and Safety in Bilbao, Spain. There is also a European Foundation for the Improvement of Living and Working Conditions based in Dublin, Ireland.

In Austria, there is a legal requirement to employ company physicians for companies with 100 or more workers. In The Netherlands, an official occupational health service is mandatory for companies employing more than 500 workers, or those in specifically defined hazardous industries, for example, the assembly of lead batteries or the manufacture of lead pigments. The occupational health services are mainly preventive in function. The activities are aimed at the early detection of occupational ill health, prevention of occupational disease, rehabilitation, reduction of sickness absence and health surveillance. The multidisciplinary staff employed includes occupational physicians, nurses, occupational hygienists and physicians’ assistants.

In Portugal, there has been a legal requirement since 1991 to provide occupational safety, hygiene and health services for private and public workplaces employing more than 250 workers. The services include safety officers, nurses, occupational physicians and worker representatives. Occupational hygienists are in short supply, and are rare as team members of these services in Portugal.

Greece has legislative provisions for occupational health services based on occupational health physicians and health visitors. The role and responsibilities of the health visitors are defined under statute. The focus of activity involves the health screening of workers. This includes pre-employment assessments and follow-up, as well as the investigation of workplace conditions.

In Italy, occupational health nursing is not as well developed a field as occupational medicine or occupational safety. The role of nurses in occupational health care is therefore limited. In occupational health services in Australia, physiotherapists are often part of the occupational health team.

In the UK, occupational health nurses and safety practitioners form one of the biggest professional groups in the provision of occupational health. The enforcement of health and safety legislation is the responsibility of a government agency—the Health and Safety Executive (HSE)—which is part of the Department of Work and Pensions. It has hygienists, engineers, nurses and physicians among its ranks of inspectors. There is no legal requirement for occupational health services, although first aid provisions are mandatory. Recent regulations have required employers to appoint ‘competent persons’ to assist them in their health and safety duties. Doctors have to be appointed by the HSE for companies with workers exposed to workplace hazards such as lead, asbestos, ionising radiation, compressed air and certain chemicals listed in the Control of Substances Hazardous to Health Regulations 1994. The availability of
occupational health services for workers is patchy, and often limited to those employed by larger organisations. More than 90% of workplaces, especially those with small numbers of employees, do not have occupational health cover. Where provided, occupational health services may be an in-house facility, or employers may rely on external contracted providers of occupational health care. Independent group occupational health services are organised on a regional or national level. An area of recent expansion in occupational health services is the National Health Service (NHS). Almost all hospitals in the NHS have some form of occupational health cover, which may be separate from, or may encompass, safety and environmental functions. The occupational health departments for the health-care industry are led by specialist occupational physicians or occupational health nurses. The activities have still tended to be clinical, with considerable focus on biological hazards. Hygienists and ergonomists, employed as part of the occupational health team for health-care workers, are rare. However, manual handling trainers are increasingly joining the occupational health teams.

In France and Germany, the model used places emphasis on the requirement for the workforce to have periodic access to an occupational health service. The rationale is to allow a review of the health status of the workers, with the aim of early detection of ill health. If there is any indication that illness may be related to workplace factors, investigations and preventive action can follow. German law provides for preventive medical examinations for exposure to a variety of workplace hazards, including noise, ionising radiation and a list of chemical agents. Several million medical examinations are performed annually under these regulations.

The Scandinavian countries, for example Finland and Sweden, have systems for occupational health cover that are much admired. Finland has a National Institute for Occupational Health based in Helsinki, with satellite departments in other cities. The activities include research, training, clinical and investigative services. There are also active efforts by this institute to help in occupational health initiatives in developing countries in Africa and Asia. Finland has had an Occupational Health Care Act since 1979. This requires all employers to provide occupational health services for their employees.

In the USA, there is a variation between states in the provision of occupational health. In New York State, private occupational and environmental medicine services predominate, including mobile clinics, multispecialty clinics and other services, invariably paid for by employers. New York State’s occupational medicine clinics have been developed as centres for the diagnosis of occupational disease, some with industrial hygienists attached. The hygienists are in a position to investigate the workplace with the cooperation of the employer and the unions. The diagnosis of a case of occupational disease is treated as a sentinel health event, which indicates a need to assess other coworkers exposed to similar workplace factors. The main government agency for enforcing occupational health and safety legislation in the USA is the Occupational Health and Safety Administration (OSHA)—part of the Department of Labor. Responsibility for research and health hazard evaluations lies with the National Institute for Occupational Safety and Health (NIOSH). This is one of the centres within the Centers for Disease Control and Prevention (CDC)—a public health agency belonging to the Department of Health and Human Services. Occupational exposure standards are produced by several organisations, including NIOSH and OSHA. However, the best known standards are the threshold limit values and biological exposure indices produced by the American Conference of Governmental Industrial Hygienists (ACGIH)—a non-governmental independent professional