

## IN-DEPTH REVIEWS

# Chemical hazards in the workplace: an overview

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Times change and, due to the hard work and diligence of occupational health and safety professionals over the last few decades, many of the health problems associated with exposure to chemicals in the workplace seem to have gone away. In many Westernized countries there has been a reduction in traditional dangerous industries such as coal-mining, iron and steel founding and heavy engineering. As an example, in the UK it is thought that <4 million people remain in manufacturing industries and, of these, probably half can be considered to be in supportive or administrative roles. On the other hand, many people in occupations (such as the entertainment and recreational industries and domestic cleaning) that are not usually perceived to be associated with health risks are now routinely exposed to chemicals in the course of their work. This changing pattern of work has led to a swing of the pendulum in favour of other occupational health priorities such as stress at work, trips and falls and musculoskeletal problems, all of which in themselves are important and demand attention both from regulators and occupational health and safety professionals.

However, chemically related ill-health is still important and should not be viewed as if all issues have been solved. This potential lack of concern has been recognized at a European Union (EU) level and recently there has been a Pan-European campaign aimed at raising awareness of the problems [1]. The EU cites some alarming statistics in support of this concern. For example, they note that, of 32 million workers employed in the EU, almost one-quarter are exposed to recognized cancer-causing chemicals, whilst 22% of all workers self-report breathing fumes and vapours for a least one-quarter of their working time. They also report that, in the EU, dangerous substances contribute significantly to the 350 million working days lost to occupational ill-health [2]. Another important consideration relates to young people entering the workforce. There will be an increasing number of new employees with pre-existing asthma, allergy or hypersensitivity who may not be adequately protected by existing control measures. They also consider the situation for many maintenance and engineering staff, who

traditionally were in-house employees but now may be outsourced and, as a result, may enter new and unfamiliar working environments in order to carry out their jobs. These are some of the reasons why we should not be complacent about the risk to workers' health from many of the hazardous substances to which people are now exposed. In addition, we should recognize that the low rate of major health problems is because of our previous efforts at understanding the toxicology and adequate control of these harmful substances through safer systems of work, not because humans have become immune to their harmful effects.

The three papers in this review section deal with very different chemical hazards, but all three are important and continuing problems where the risks to health, if uncontrolled, are serious. Organophosphates are widely used in agriculture, veterinary medicines and public health and have been used extensively because of their high selective toxicity towards insects and relatively low-toxicity towards mammals, including humans. However, this is not entirely the case. Worldwide, both acute organophosphate poisoning and more subtle chronic effects from low-level exposure are of concern. The paper by Kamanyire and Karalliedde [3] clearly sets out the mechanism of poisoning and how this impinges on clinical treatment. Lead, perhaps along with silica, is one of the oldest traditional occupational toxins. However, in spite of >100 years of research, there is still continuing debate about what constitutes a level of lead exposure in the working environment that carries no risk to health. Moreover, a recent EU directive on lead re-examines what constitutes acceptable lead uptake levels within the European Community. In addition, recent research from the USA indicates that it is not possible to demonstrate a level of blood lead for children, even below 10 µg/dl, that does not carry a risk of a reduction in intelligence quotient. In other words, it suggests there may be no safe level [4]. The paper by Gidlow [5] presents a most helpful overview of some of the more important features of lead toxicity and the ways in which exposure needs to be controlled. The final paper, by Cummings [6], gives an important overview of a problem that many people think is solved and relates to emergency treatment for suspected cases of cyanide poisoning. Cyanide is still widely used and, although poisonings are relatively rare,

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the consequences are so serious that treatment has to be both accurate and prompt in order that fatality is avoided.

These three papers illustrate that important chemical hazards still exist in the workplace and that associated ill-health and tragedy can only be avoided if we understand the potential problems associated with their use and promote the use of appropriate control measures. In this latter respect, the UK Health & Safety Executive should be commended for their recent development and launch of e-COSHH Essentials. This is a new system for providing information on the safe handling of hazardous substances by all, but particularly by small and medium-sized enterprises that may lack health and safety expertise. The system is, of course, available worldwide as it has been especially designed for the internet ([www.coshh-essentials.org.uk](http://www.coshh-essentials.org.uk)).

## References

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