Safety Services Guidance

Respiratory sensitisers

Key word(s):	Respiratory sensitisers, asthmagens, See also guidance on skin sensitisers
Target audience:	Anyone using or exposed to sensitisers; COSHH assessors, Principal Investigators

Management cycle	Useful paragraphs
Plan	1-4
Do	5-12, 13-17
Monitor	18-20
Review	

Introduction

1. Respiratory sensitisers can cause occupational asthma and in the worst cases, exposure can be life-threatening.

2. Once someone is sensitised, continued exposure can result in permanent vulnerability and increasingly severe symptoms. Once established, attacks can be triggered by exposure to minute concentrations of the sensitiser or, symptoms may be exacerbated by other triggers such as environmental tobacco smoke, general air pollution, or even cold air. They can occur immediately upon exposure, or several hours later. Individuals are seldom sensitised on their first exposure. Generally, it happens after months or even years of breathing in the sensitiser. There is a significant degree of personal variation in who may respond to a sensitiser and to what extent.

3. By its very nature, once established, sensitisation is often extremely difficult to treat except by total avoidance of the substance, and prevention is therefore the key to effective control.

4. Sensitisers are subject to the Control of Substances Hazardous to Health Regulations 2002 (as amended). Exposure must be assessed, and avoided or prevented wherever this is reasonably practicable.

Respiratory sensitisers

5. Safety data sheets (sds) should always be consulted for information on risks. Before legal changes to classification and labelling (i.e. under the CHIP regulations), respiratory sensitisers were assigned the risk phrase R42 "May cause sensitisation by inhalation". Older sds may still use these phrases. Under the newer Classification, Labelling and Packaging (CLP) Regulations[1], the hazard statements are:

   H334 – May cause allergy or asthma symptoms or breathing difficulties if inhaled.
   H335 – May cause respiratory irritation.

6. The following table is a summary of the substances responsible for most cases of occupational asthma. Appendix 1 includes a more detailed list.

[1] http://www.hse.gov.uk/chemical-classification/legal/clp-regulation.htm

Substance group	Common activities
Isocyanates	Paint spraying, production of foams
Flour	Handling of grain, milling, baking etc.
Electronic soldering flux	Soldering, electronic assembly
Laboratory animals	Laboratory work. See Occ Health guidance on Allergies to Laboratory Animals and para 15 below.
Wood dusts	Woodworking generally where dusts are formed
Insect frass	Laboratory work with insects. See Occ. Health's guidance on Working with Insects
Some glues / resins	Work with epoxy resins.
Glutaraldehyde	Use as a tissue fixative. See para 12-14 below.

7. Sufferers may report a variety of symptoms such as attacks of coughing, wheezing, tightness of the chest, runny or stuffy nose, watery or prickly eyes. If you suspect anyone might be suffering from sensitisation, ask them to report to Occupational Health without delay, taking details of the substance(s) suspected of being the cause, if possible.

8. If respiratory sensitisers are in use, ensure all COSHH assessments take this into account. The outcome of the COSHH assessment should be a conclusion either that exposure is insignificant and unlikely to result in a risk to health, or that specified control measures must be adhered to.

9. Consider the following control measures in the order given below:

   - replace the sensitiser with another less harmful substance or use an alternative procedure altogether. Avoidance is a key objective, because of the impact these substances can have on future health
   - use a formulation that ensures the substance is less likely to become airborne (e.g. granules instead of powder, pre-made solutions or gels)
   - segregate the work or totally enclose it – remember that people in the vicinity may also be exposed
   - partially enclose the process, and provide local exhaust ventilation (which will need to be examined every 14 months)

10. If the above measures do not adequately control exposure to as low as reasonably practicable, provide suitable respiratory protective equipment.

11. Review the COSHH assessment and if appropriate make any necessary changes.

Glutaraldehyde

12. Glutaraldehyde (Cidex) is a well-recognised respiratory sensitiser and was withdrawn from sale for use as a disinfectant in 2002. It should not therefore be used, or be available for use, as a disinfecting or sterilising agent for any purpose (including the disinfection of heat-sensitive equipment, surgical instruments, bronchoscopes and endoscopes).

13. However, glutaraldehyde is still used as a tissue fixative in histology and pathology labs and as a hardening agent in the development of X-rays. University employees may also come across facilities under the control of an NHS Trust or other institution in areas such as electron microscopy and radiology.

14. Glutaraldehyde-free chemicals are now more widely available for these photographic and X-ray applications (see http://www.tetenaluk.com/home) and it is strongly recommended that you use them unless there are compelling technical reasons not to make the change. If it is used, it should be purchased and stored at the lowest volumes and concentrations possible. Waste generation should be kept to a minimum and explicit contingency plans incorporated into the COSHH assessment in case of spillage.

Laboratory Animal Allergens (LAAs)

15. Laboratory animal allergy is an allergic hypersensitivity response to animal-derived allergens in urine, fur, hair, dander, saliva, droppings and serum. The HSE have issued a detailed Guidance Note on how exposure to these allergens should be controlled.

Information to give to users of respiratory sensitisers

16. Regulation 12 of the COSHH Regulations 2002 (as amended) requires employers to give information, instruction and training to persons who may be exposed to substances hazardous to health. This includes staff and students, and clearly relates to the use of sensitisers.

17. The information given will need to be tailored to the individual(s) receiving it, and will need to be more explanatory and detailed for undergraduate students than for experienced staff. In all cases, however, it should include:

    - the nature and degree of risks to health, including any known factors that may increase risk (e.g. smoking)
    - symptoms of sensitisation

- the importance of reporting relatively minor symptoms at an early stage (sensitisation is irreversible)
- the proper use of any control measures needed to ensure exposure is insignificant, or adequately controlled
- the need to report any failures in the control systems (e.g. faults on fume cupboards)
- if health surveillance is necessary, the reasons and arrangements for this.

Health surveillance for respiratory sensitisers

18. Under the COSHH Regulations, health surveillance is required where:

    - certain substances are used in certain processes (mainly manufacturing), or
    - exposure gives rise to an identifiable disease or adverse health effect that may be related to exposure and there are valid techniques for detecting the disease or effect.

19. Respiratory sensitisers which can cause occupational asthma fall into the second category.

20. The COSHH assessment should identify the need for health surveillance, in addition to suitable control measures. If it does, the assessor[2] must notify the University Occupational Health Service of all users needing health surveillance, and provide a copy of the COSHH assessment on request. The assessor must also advise users of the requirement to attend Occupational Health in accordance with the agreed surveillance protocol

[2] Or the person for whom the assessment is carried out. For researchers, this will normally be the PI.

Bibliography

Occupational Health Services Procedure on the Management of exposure to Laboratory Animal Allergens

HSE microsite on asthma
HSE Workers information card on occupational asthma
HSE microsite on health surveillance

Appendix 1 Respiratory sensitisers

The following list comprises groups of substances or substances which may not be supplied with a safety data sheet. All these substances should be regarded as respiratory sensitisers:

Carmine (red food colouring)
Chloroplatinates (and other halogenoplatinates)
Chromium (VI) compounds
Cobalt (metal and compounds)
Cow epithelium / urine
Diazonium salts
Flour dust
Grain dust
Hardwood dusts
Laboratory animal excreta
Latex
Penicillins
Reactive dyes
Rosin based solder flux
Softwood dusts
Storage mites

In addition, any newly synthesised substance or intermediate substance analogous to those listed above or to substances with the R42 risk phrase, or H334 or H335 hazard statements (for example, a new substance containing the isocyanate group) should be regarded as a potential sensitiser, until there is substantive evidence to the contrary.

Substances under consideration by HSE as respiratory sensitisers (with hazard statements relevant to sensitisation only, 2015):
α amylase (classified by Sigma Aldrich as H334)
Acetic anhydride (classified by Sigma Aldrich as H331 – toxic if inhaled)
Ethyl cyanoacrylate (classified by Sigma Aldrich as H335)
Flour dust (listed as a sensitiser in HSE EH40)
Ethylamine (classified by Sigma Aldrich as H335)
Methyl cyanoacrylate (classified by Sigma Aldrich as H335)
P-phenylenediamine (classed by Sigma Aldrich as H331, H311, H317)

Substances also reported to cause sensitisation
Various antibiotics and enzymes
Cockroaches
Pancreatic extracts
Mist from oil in water cutting fluids (connected to Pseudomonas?)
Some food dusts such as tea, soy bean, castor bean, coffee bean dust,
Food proteins eg proteins in crustaceans, egg, fish

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