Guidance for appointed doctors on the Control of Substances Hazardous to Health Regulations 2002 (as amended)

Medical surveillance of workers exposed to Schedule 6 substances and processes

Introduction

1 This guidance explains how appointed doctors should conduct medical surveillance on workers exposed to a substance and working in a process specified in Schedule 6 of the Control of Substances Hazardous to Health Regulations 2002 (COSHH)[1] (as amended). It updates the 2011 version following a review by the Health and Safety Executive (HSE). Appointed doctors should also be familiar with the Approved Code of Practice and guidance *Control of substances hazardous to health* (L5)[2] and HSE's appointed doctor website.[3]

2 Historical exposure to substances included in Schedule 6 could be excessive, resulting in significant adverse health effects. With developments in technology and current legislation, exposure levels are now much lower. Therefore, health effects resulting from present-day exposures are uncommon.

3 Medical surveillance by an appointed doctor or employment medical adviser is a legal requirement where:

- an employee is exposed to a Schedule 6 substance and process;
- there is a reasonable likelihood that an identifiable disease or adverse health effect will result from that exposure.

This will be informed by the employer's COSHH risk assessment.

4 There may be employees who have worked with a specific substance for many years and at a time when exposure levels were higher than would be expected from current work practices. For such individuals, even if exposure has ended, it may be appropriate for the employer to continue medical surveillance while they are working for them. For example, this may benefit employees where an adverse health effect might be anticipated after a long latency period and it can be reliably detected at an early stage.

Role of the appointed doctor

5 Your role as an appointed doctor is to:

- liaise with the employer to ensure you understand the nature of the work being done and visit the workplace, where practicable, to see the working conditions and workers under medical surveillance;
- conduct medical examinations and assess fitness of individuals to work with the substance;
- maintain adequate clinical records for the medical examinations completed;
- provide workers with information on the health effects associated with exposure to the substance;
- submit statistical returns on request.

Medical surveillance

General aspects

6 The purposes of medical surveillance are to:

- make an initial assessment of employees' fitness to work with the substance;
- assess employees' fitness to continue working with the substance;
- identify any early health effects which may be caused by exposure;
- alert employers to any problems so they can review their risk assessment and control measures, and identify where they need to take further steps to manage the risk;
- emphasise the need for employees to use available control measures and follow good working practices.

7 Medical surveillance must be carried out at intervals of no more than 12 months. You can use discretion to shorten this interval where appropriate and to determine the exact nature of the medical examination.

8 Regulation 11(3) of COSHH requires employers to maintain a health record for each worker under health surveillance. It should contain the information set out in the Approved Code of Practice[2] but should not contain confidential clinical information. The employer must retain the health record for at least 40 years from the date of the last entry.

9 You should maintain separate, accurate and comprehensive clinical records.

10 COSHH makes provision for an employee or employer who is aggrieved by a decision of an appointed doctor to apply for the decision to be reviewed by HSE. Such an application should be made in writing to HSE's Principal Medical Adviser within 28 days of being informed of the decision. An employee or employer who wishes to appeal should follow the general procedure set out for appeals under the Ionising Radiations Regulations 2017.[4]

Vinyl chloride monomer

11 Vinyl chloride monomer (VCM) is a colourless gas with a slightly sweet odour and is mainly used in the production of polyvinyl chloride (PVC) plastics in enclosed systems. Exposure is mainly by inhalation. It has narcotic effects at high concentrations and may cause unconsciousness. The longer-term health effects of chronic exposure are acro-osteolysis, angiosarcoma of the liver and non-cirrhotic portal fibrosis. These conditions were first identified in association with historically high exposures to VCM but are unlikely to arise from present day working practices due to strict control of exposure. A review of evidence by the International Agency for Research on Cancer in 2012 concluded that VCM can also cause hepatocellular carcinoma.

12 Acro-osteolysis is caused by decalcification of the terminal phalanges of the hands and feet. Typically, it affects the hands, giving rise to 'pseudo-clubbing', which can be accompanied by scleroderma and Raynaud's disease. However, the three conditions can arise independently of one another in association with VCM exposure. Following removal from exposure, recalcification and some improvement in Raynaud's disease may occur.

13 Angiosarcoma of the liver is a rare tumour in the general population. Its development typically has a long latency period of many years. It is characterised by abdominal pain, weight loss and progressive jaundice. Hepatomegaly may occur in advanced cases. The prognosis is poor.

14 You should inform workers, particularly new workers, of how VCM could harm them and the signs and symptoms that can develop, while explaining that adverse health effects are now uncommon due to current working practices and strict control of exposure.

15 At periodic review, you should question workers about their responses to cold, any arthritic symptoms, abdominal pain or weight loss, and note any jaundice. You should examine the hands for any changes in the shape of the fingers. If there is evidence of acro-osteolysis or Raynaud's disease, you should request hand X-rays only if justified on individual clinical grounds, documenting the clinical rationale in the worker's medical record. You should examine the abdomen, though clinical hepatomegaly does not usually occur until angiosarcoma is advanced.

Nitro or amino derivatives of phenol and of benzene or its homologues

16 These are a group of simple, single-ringed aromatic compounds used extensively in the chemical industry. Under COSHH, the requirement for medical surveillance is confined to their manufacture or the use of any of these substances in the production of explosives, as specified in Schedule 6. Exposure is mainly by inhalation or dermal routes. The key adverse health effect resulting from exposure to these substances is methaemoglobinaemia though cases are uncommon and severe cases are rare.

17 Methaemoglobinaemia results from oxidation of iron from the ferrous to ferric state in the haem group of haemoglobin molecules. This reduces the oxygen-binding capacity of red cells and their ability to release oxygen to the tissues, resulting in hypoxia. Small amounts of methaemoglobin are produced continually but are maintained at around 1% of the proportion of total haemoglobin. Cyanosis becomes evident at concentrations between 10-20%. As concentrations increase above 20%, signs and symptoms include headache, dizziness, tachycardia, weakness and lethargy, and at

high levels, arrythmias, seizures and unconsciousness may occur. Individuals with anaemia or underlying cardiac or pulmonary disease might develop clinical features at lower concentrations.

18 If an employee is known to have glucose-6-phosphate dehydrogenase (G6PD) deficiency, you should document it. Treatment of methaemoglobinaemia with methylene blue in an individual with G6PD deficiency may trigger haemolysis.

19 You should inform workers, particularly new workers, of how the chemicals may harm them and the signs and symptoms that can develop.

20 During periodic review, you should enquire whether there were any overexposures during the previous 12 months. You should examine the worker's mucous membranes for cyanosis. Examination should normally include haemoglobin measurement, methaemoglobin if clinically indicated, and any other haematological tests necessary to confirm anaemia where appropriate.

Potassium or sodium chromate or dichromate

21 These hexavalent chromium compounds are potent oxidising agents with a variety of industrial uses, including manufacture of dyestuffs, electroplating and leather work. Under COSHH, the requirement for medical surveillance is confined to manufacture as specified in Schedule 6. Exposure can occur by inhalation, ingestion or dermal routes. They can irritate the skin, upper respiratory tract and eyes, and cause locally destructive ulceration (chrome holes). Repeated exposure can cause dermatitis, mucosal ulceration of the nasal septum (which may lead to ischaemic perforation), asthma and lung cancer.

22 Good personal hygiene is important in helping to prevent chromate injuries. Habits such as nail biting, smoking and nose picking may increase exposure. Workers should be aware of the need for cleanliness and prompt attention to wounds, including superficial injuries. HSE has published a leaflet for employees on working with chromium.[5]

23 At periodic review, you should examine the skin for signs of ulceration. Pay particular attention to the hands, forearms, face and neck. Carefully examine the nasal septum using a speculum. Any lesions should be treated promptly. Early referral is important as ulcers can be very penetrating and destructive. You should also check the skin for signs of irritant or allergic dermatitis. Irritant dermatitis is usually associated with areas of tight clothing such as cuffs, collars and socks. It is usually mild and self-limiting.

24 At the time of the assessment, document any episodes of skin or septal disease occurring between periodic assessments. Ensure that the affected area has properly healed.

25 You should enquire about respiratory symptoms and conduct a clinical examination of the respiratory system.

Ortho-tolidine, dianisidine and dichlorobenzidine and their salts; auramine and magenta

26 These substances have been used in the manufacture of dyestuffs, and in the rubber and electric cable manufacturing industries. Under COSHH Schedule 6, the requirement for medical surveillance for auramine and magenta only applies during manufacture. Exposure can occur by inhalation, ingestion or dermal routes. The key health concern is bladder cancer.

27 The latency period is usually many years. Affected workers may present with abdominal pain, renal colic or haematuria, though these signs and symptoms may occur late in the condition.

28 The risk of developing bladder cancer was greater in the past when workers where more highly exposed. At that time, it was common to use urinary cytology to detect pre-malignant or early malignant changes. However, this technique can lead to a high proportion of false positive tests. In addition, early detection does not appear to have a significant impact on the outcome of the condition. Therefore, it is not appropriate to start a urine screening programme for present-day, low-risk groups.

29 You should consider the personal hygiene and habits of workers, particularly new workers. Nail biting and smoking may increase exposure. You should emphasise the importance of good personal hygiene and skin cleanliness in helping to prevent bladder cancer.

30 During periodic review, you should enquire about relevant symptoms. Evidence of cystitis, haematuria or an abnormal urine test should be investigated further. You should also examine the skin, especially on the arms and face, to check for staining which could indicate contamination.

Carbon disulphide; disulphur dichloride; benzene, including benzol; carbon tetrachloride; trichloroethylene

31 These substances have a variety of industrial uses, for example as solvents and in the manufacture of other substances. However, under COSHH Schedule 6, the requirement for medical surveillance applies where they are used, or given off as vapour, in the manufacture of India rubber or of items made wholly or partially of India rubber. Absorption is mainly by inhalation or through the skin.

32 At high concentration, carbon disulphide, benzene, carbon tetrachloride and trichloroethylene have narcotic effects, causing headache, dizziness and depression of the central nervous system. Longer-term effects of carbon disulphide exposure include

peripheral sensorimotor neuropathy, coronary heart disease and hypertension. Benzene can cause bone-marrow suppression resulting in aplastic anaemia. It can also cause leukaemia. A review of evidence by the International Agency for Research on Cancer in 2014 concluded that trichloroethylene causes cancer of the kidney. Disulphur dichloride is a corrosive liquid that can cause irritation of the eyes and respiratory tract, skin burns and dermatitis.

33 Workers should be aware of the health risks of working with these substances. For workers who will be exposed to carbon disulphide, you should record a baseline blood pressure measurement.

34 At periodic review, you should enquire about any relevant symptoms such as headache, light-headedness and lethargy, which might suggest significant exposure, and peripheral sensory changes. You should exclude peripheral and cranial nerve damage and look for signs of dermatitis. Many of the symptoms are non-specific and common in the general population.

35 It may be possible to confirm or exclude increased absorption by conducting tests on urine or blood, for example urinary trichloroacetic acid is an indicator of trichloroethylene absorption. However, routine testing is not required. Similarly, there is no need to conduct blood tests for chromosomal analysis in workers exposed to benzene.

Pitch

36 Pitch is a thick, black liquid that may occur naturally but is usually obtained as a by-product of coke manufacture (coal tar pitch). It can be further refined to produce other chemicals. Under COSHH, the requirement for medical surveillance is confined to its use as a binding substance in the manufacture of blocks of fuel, as specified in Schedule 6. Pitch contains a variety of polycyclic aromatic hydrocarbons (PAHs) which are carcinogens. Occupational exposure to pitch is associated with an increased risk of skin cancer. Commonly, cases are associated with heavy, long-term contact, contaminated clothing, storage of contaminated rags in pockets and poor personal hygiene. It can be cured if treated at an early stage, so medical surveillance is important.

37 The latency period for skin cancer is typically many years. The lesions may be preceded by the development of epitheliomas referred to as pitch warts. They are usually found on chronically contaminated areas such as the hands, arms and face but can arise on any part of the body. The scrotum seems to be especially vulnerable. Tumours often start as small, round, firm, sessile and painless growths which may ulcerate and bleed. Spread is usually local, at least initially, to adjacent and regional lymph nodes. Pre-malignant and malignant lesions may co-exist, so careful examination of the skin is necessary.

38 Contact with pitch can also cause a photosensitive dermatitis, often called pitch smarts. A history of this condition suggests significant contact with pitch.

39 You should note any previous occupational exposure to agents or substances that may cause skin cancer. Workers should be aware of the importance of good personal hygiene in helping to prevent skin cancer, emphasising skin protection and cleanliness. You should encourage workers to carry out regular self-inspection of their skin, including the scrotal area, and to report any abnormalities. HSE has published a leaflet for workers on skin cancer caused by pitch and tar.[6]

40 At periodic review, you should enquire about exposure to pitch and any relevant signs and symptoms such a pitch smarts. You should thoroughly examine the skin, especially exposed areas. Look for pitch staining of the skin which imparts a brownish colour or hyperpigmentation, which sometimes occurs following contact. Suspicious lesions need referral for diagnosis and treatment. If there are signs or symptoms of significant exposure, which are recurrent and without obvious remediable cause, you should consider removing the worker from exposure.

Reportable diseases under RIDDOR

41 Under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR),[7] cancer attributed to an occupational exposure to a known human carcinogen or mutagen must be reported. This includes cancer caused by relevant Schedule 6 substances. Employers have a duty to report these diseases when informed in writing of the specific diagnosis by a registered medical practitioner.

References

1 *The Control of Substances Hazardous to Health Regulations 2002* SI 2002/2677 The Stationery Office www.legislation.gov.uk/uksi/2002/2677/contents/made

2 *Control of substances hazardous to health. The Control of Substances Hazardous to Health Regulations 2002 (as amended). Approved Code of Practice and guidance* L5 (Sixth edition) HSE Books 2013 www.hse.gov.uk/pubns/books/l5.htm

3 HSE appointed doctor website: www.hse.gov.uk/doctors/

4 Medical appeal: Ionising Radiations Regulations 2017 www.hse.gov.uk/radiation/ionising/appeals.htm

5 *Chromium and you: Working with chromium – are you at risk?* INDG346(rev1) HSE 2013 www.hse.gov.uk/pubns/indg346.pdf

6 *Skin cancer caused by pitch and tar* (INDG435) HSE 2011 www.hse.gov.uk/pubns/indg435.pdf

7 *The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations* 2013 SI 2013/1471 The Stationery Office www.legislation.gov.uk/uksi/2013/1471/contents/made

Further information

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