Hazards associated with foundry processes: Hand-arm vibration - symptoms and solutions

Foundries Sheet No 9

Introduction

This information sheet was produced by HSE's Molten Metals National Interest Group in conjunction with the Foundries Industry Advisory Committee through its sub-committee on noise and vibration. It is one of a series on hand-arm vibration (see Further information from HSE Books) and deals with:

- the effects of vibration;
- symptoms to look for; and
- what action to take if symptoms are suspected.

What is HAVS ?

Exposure to vibration of the fingers, hands and arms is associated with a group of disorders which are known as 'hand-arm vibration syndrome' (HAVS). These include:

- blood circulation effects - vibration white finger (VWF);
- damage to the nerves and possibly to the muscles and soft tissue;
- bone and joint disorders.

Symptoms

VWF is characterised by attacks of blanching (whitening) when the fingers become numb. Initially only the finger tips are affected, but over a period of time the area is likely to extend further down the affected fingers. Attacks last up to half an hour and often end with a painful, throbbing return of blood flow as the colour of the fingers changes to bright red.

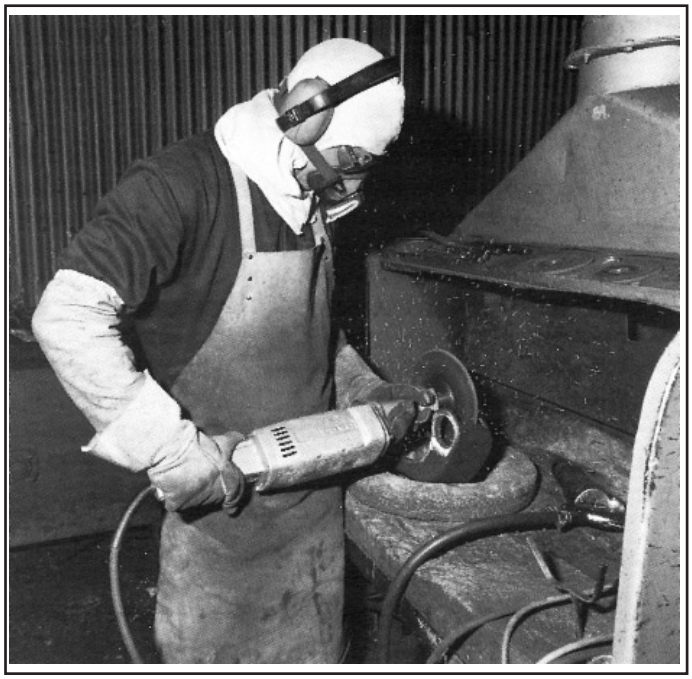
Tingling and numbness caused by nerve damage can develop independently from blanching and eventually the fine sensation in the finger tips may be permanently lost, making it difficult to undertake delicate jobs.

These effects are separate from the tingling which can occur during exposure to vibration. Reduced grip strength has also been found in some exposed workers.

Pain and stiffness in the hands and joints of the wrists, elbows and shoulders may also occur.

Who is at risk?

HAV usually arises from finger or hand contact with either a powered tool or material being held against a moving surface (eg a pedestal grinder).



The users of rotating or percussive hand-guided tools where the hands are exposed to high levels of vibration are at greatest risk. Such tools are widely used in most areas of industry, particularly in the foundry industry, where chipping hammers and grinding/polishing tools and machines are in common use.

Processes which can give rise to HAVS include manual moulding, fettling, knock-out, dressing and finishing and furnace relining.

The wide range of tools which can give rise to the development of HAVS includes chipping hammers, picks, impact hammers, heavy duty hammer drills, hand-held grinders, swing frame grinders, pedestal grinders, linishers and rotary burrs.

The degree of risk depends on:

- the amount of tool vibration;
- the length of time for which the tool is used;
- whether tool use is intermittent or continuous;
- workplace temperature;
- individual susceptibility;
- the method of work;
- the ergonomics of the task.

Solutions

Action by employers

Risk assessment

Employers are required to assess risks to the health of workers including those arising from exposure to vibration and to take action to control those risks.

If the assessment indicates that the risks from HAV are not adequately controlled, measures such as those listed below should be taken.

Reduction of exposure time

The duration of exposure is a significant factor in the incidence of HAVS. Wherever possible, the method of work should be so arranged as to reduce an individual's continued exposure to vibration, eg by work-sharing or job-rotation and periodic resting of the hands. Example: In order to halve the individual's daily exposure, the period of tool use must be reduced to one quarter.

Health surveillance

When carrying out work using tools where there is a significant risk of HAVS, a suitable programme of occupational health surveillance will be necessary as required under the Management of Health and Safety Regulations (1992).[1] Any symptoms arising can then be assessed, their relationship with work determined and appropriate advice given to the individual.[2] HAVS is reportable under RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations)95.[3]

Tool selection and care

When selecting new tools, information should be sought from suppliers about the vibration levels which their tools produce.

Vibration of tools may be partially controlled by effective maintenance procedures.

Training employees

The individual work techniques used by employees to operate hand tools can affect the extent to which vibration is absorbed by the hands. It is therefore essential that all employees are made aware of what HAVS is, and are trained in the necessary precautions to minimise the risks.

The actions in the following section should be actively encouraged.

Action by employees

- Try to keep hands and body warm at all times - both at work and away from work.
- Exercise fingers periodically during work to encourage blood flow.
- Remember that smoking cigarettes adversely affects blood circulation and makes VWF worse.
- Report any numbness or whiteness in the fingers to the works medical staff. If there are no works medical staff, go and see your own doctor (GP) and explain where you work and what you do.

The future availability and accuracy of the references listed in this publication cannot be guaranteed.

References (HSE Books)

1 Management of health and safety at work Management of Health and Safety at Work Regulations 1992. Approved Code of Practice ISBN 0 7176 0412 8

2 Five steps to risk assessment IND(G)163L (Single copies free; also available in priced packs of 10, price £5.00, ISBN 0 7176 0904 9)

3 Everyone's guide to RIDDOR 95 HSE 31 (single copies free; also available in priced packs of 10, price £5, ISBN 0 7176 1077 2)

Further reading and information

Hazards associated with foundry processes: Hand-arm vibration - the current picture FNIS 8

Hand-arm vibration: Advice on vibration white finger for employees and the self-employed INDG126 (free)

Hand-arm vibration: Advice for employers INDG175 (free)

Hand-arm vibration HSG88 ISBN 0 7176 0743 7

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS Tel: 01787 881165 Fax: 01787 313995. HSE priced publications are also available from good booksellers.

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http://www.open.gov.uk/hse/hsehome.htm

This information sheet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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