Code of Practice

April 2017

Control of Hand Arm Vibration at Work - Guidance

Occupational Health & Safety Service
HSD050P (rev 2)

UNIVERSITY OF CAMBRIDGE

CONTENTS

1. Introduction

The Health and Safety at Work Act (HSAWA) requires the University of Cambridge to ensure (so far as is reasonable practicable) the health safety and welfare of all employees and others who may be affected by work activity [1].

Measures must be put in place to protect employees from the risk of hand-arm vibration syndrome (HAVS) which can be caused by exposure to power tools or other vibrating equipment for long periods.

2. Legislation

The Management of Health and Safety at Work Regulation (MHSAW) 1999[2] and the Control of Vibration at Work Regulations (COVWR) 2005[3] require steps to be taken to prevent the risk to employees of HAVS.
These measures will include:

- assessing the risks from vibration exposure;
- taking steps to reduce vibration exposure;
- considering vibration risk when purchasing or hiring equipment;
- provision of training and information for employees on the risks from vibration and the measures in place to reduce these;
- providing health surveillance following a suitable and sufficient risk assessment.

3. Hand-arm vibration syndrome (HAVS)

Hand-arm vibration is a hazard in occupations involving the use of hand-held power tools (such as grinders or hammer drills), hand-guided machinery (such as lawn mowers and plate compactors) or hand –fed machines (such as pedestal grinders). Prolonged and regular exposure to this vibration can affect the operator's health, resulting in painful and disabling disorders of the nerves, blood supply, joints and muscles of the hands and arms – collectively known as hand-arm vibration. The symptoms that effect the blood supply to the fingers is also known as vibration white finger (VWF).

4. Exposure action and limit values

The daily vibration exposure depends on the level of vibration and exposure time. The Control of Vibration at Work Regulations introduced an exposure action value (EAV) and exposure limit value (ELV) for HAVS:

Exposure Action value (EAV) – 2.5m/s^2*A*(8)
Wherever exposure at or above this level occurs certain actions, including health surveillance, are required to control the risk of HAVS.

Exposure Limit value (ELV) – 5 m/s^2*A*(8)
This is the maximum vibration exposure permitted for any individual in a single day

Under the Control of Vibration at Work Regulations the prevailing requirement is to reduce the vibration exposure to as low as reasonably practicable (ALARP) by adopting suitable alternative work methods.

1 *The Health and Safety at Work Act 1974*
2 *The Management for Health and Safety at Work Regulations1999*
3 *The Control of Vibration at Work Regulations 2005* Guidance on Regulations HSE Books

5. Risk assessment

Vibration risk assessment is required if employees work with hand-held tools (e.g., sanders, drills, breakers, chain saws, hedge trimmers); hand-guided tolls (e.g., pedestrian lawn mowers, buffers) or materials held against a vibrating object (e.g., use of a grinder or timber being guided through a band saw).

A risk assessment requires:

- **an assessment of the vibration magnitude** from each piece of equipment used by:
  - measuring vibration values: http://www.operc.com/havtec/
  - vibration level measurements using triaxial measurements – this is not usually necessary for the work activities carried out at the University, but can be arranged
  - by risk assessment to include manufacturers data and information on typical tool vibration levels and daily exposure
- **identify and record who might be affected** – include maintenance staff
- **identify and record the daily vibration exposure time for those affected** ensuring that the time spent with the hands actually in contact with the vibrating tool is measured ('trigger time') which is usually considerably shorter than the 'time on the job' because of breaks etc.
- **calculate the daily exposure for individuals** dependent on the daily exposure (the A(8) value) and magnitude (level) or the vibration and total time during the day; remembering that if more than one tool is used in a day the effects are cumulative.
  The Health and Safety Executive have produced a 'ready-reckoner' for vibration exposure see: http://www.hse.gov.uk/vibration/hav/vibrationcalc.htm
  allowing a daily exposure level from any combination of vibration magnitude and exposure time. A spreadsheet to calculate vibration exposure is also available to calculate exposure in A(8) values and exposure points enabling conversion of working times and vibration magnitudes into an overall exposure factor and the précis of exposures if more than one piece of equipment used.
- **identify and record other risk factors** such as working in cold and wet environments

Where exposure exceeds the nominal levels and /or the EAV assistance should be sought from the Safety Office to assist with risk assessment and reduction.
The risk assessment should be reviewed if there is any change in vibration exposure and at least every two years.

6. Control and risk management

The risk assessment should include an action plan identifying measures already in place to reduce the risk as low as is reasonably practicable.
Planned measures should include action such as:

6.1 Eliminating and reducing the risk by

- change process - mechanisation / automation
- tool / work equipment selection
- regular checking and maintenance of equipment
- limiting exposure e.g., job rotation, group work, reducing exposure time
- ergonomic design of the tool and workplace to reduce the weight of the tool and force applied by the operator e.g., suspended tooling system
- encouraging good posture
- create guidelines for correct tool selection and use on each type of operation
- suitable work temperatures

- encourage operators to:
    - exercise hands during work periods
    - give up or cut down on smoking
    - keep warm and dry - provision of warm clothing and gloves. Wearing anti-vibration gloves is **not** an effective way to reduce risk
    - take regular short breaks from exposure

6.2 Implementing a low vibration purchasing / hiring policy

The Supply of Machinery (Safety) regulations 1992 (as amended)[4] include duties for manufacturers and suppliers (among others) to design, manufacture and supply tools for which risks to vibration have been reduced to the lowest level. Suppliers should supply emission data and additional information as necessary, to explain the vibration risk needed to manage the risk – including an indication of any special operator needs.

The vibration of the tool depends on:

- the vibration emission of the tool, and
- the length of time that the tool is use;

therefore if the performance of the tools is identical it is beneficial to select the one with the lower vibration emission since this can be used for longer periods of time.

The aim should be to choose a combination of tools for a job which result in a daily exposure level of less than 2.5m/s^{2}A(8). Tools purchased should come with information that explains the extent of the vibration hazard to be managed. The Power tools selected by departments must have a statement of the vibration level or a statement that the vibration has produced a vibration emission below 2.5 m/s^2.

Consider the following when making an assessment of the suitability of the tools:

- assess operational factors and any potential vibration reduction measures
- borrow the vibration tools from potential suppliers
- ask if the vibration emission values are typical of the vibration levels for the planned work / use
- the ergonomic factors i.e., tool weight, efficiency and suitability for task
- realistic operational and productivity tests for all tools
- accurate vibration assessments on each tool in 'normal' use
- ask the workforce for their view
- combine the information to decide which is the most effective tool for the task and condition of use
- keep a record of the process and results

6.3 Information instruction and training

All employees who are exposed to vibration should be given adequate training to include:

- the risks from HAV and how to reduce them
- correct operation and maintenance of equipment
- the health effects of HAVS, recognising and reporting symptoms
- the risk factors e.g., levels of vibration, daily and cumulative exposure
- arrangements for and duty to co-operate with the health surveillance programme, how it is provided and how results are processed

4. The Supply of Machinery (Safety) regulations 1992 (as amended)

6.4 Health surveillance

Exposure to vibration carries a risk of ill health effects but is most likely to occur with exposures above the EAV of 2.5m/s^2 but can occur at lower exposure levels.

HAVS includes the following conditions of which one or more may be present in affected workers:

- vascular disorders – commonly blanching of the finger, especially when exposed to the cold / wet or to vibration
- neurological disorders – including numbness, tingling of the fingers, reduced strength, reduced sensitivity and loss of dexterity
- musculo-skeletal disorders – such as joint pain and stiffness, reduced strength and dexterity
- carpal tunnel syndrome

Where exposure is likely to exceed the EAV or employees are at risk e.g., have pre-existing diagnosis of HAVS, Carpal Tunnel Syndrome or other possible relevant condition, employees must be registered on the health surveillance programme. Health surveillance is carried out by the Occupational Health Service (OHS) using a suitable questionnaire and involves an:

Initial assessment

- for all existing employees identified through the risk assessment process as requiring it, and
- all new employees identified at pre-placement.

Annual or enhanced assessment

- for all employees exposed above the EAV, and
- those identified by the OH as being at increased risk.

6.5 Maintenance programme

Departments must establish a maintenance programme for all vibration emitting tools used and carry out regular maintenance. Power tools should be serviced and maintained in accordance with the manufacturer's maintenance schedules to prevent unnecessarily high vibration levels and ensure efficient operation.
This should:

- prevent avoidable increases in vibration resulting from deterioration of the tool i.e., worn parts and /or loose components
- ensure tools are kept sharp and vibration reduction components such as springs, dampers and isolators remain efficient and effective
- encourage operators to report any unusual vibration levels.

A suitable maintenance record should be kept.

6.6 Monitoring control measures

Regular review of management actions and control measures should include:

- risk assessment review to ensure continued suitability and sufficiency
- a review of vibration exposure to ensure it remains below the ELV
- a review magnitude and point systems
- design and layout of workplace and limited duration of exposure
- the careful maintenance and proper use of tools
- refresher instruction, information and training for employees
- a tiered health surveillance programme and restriction of individuals at particular risk.
- an increased level of health surveillance for susceptible individuals
- a full investigation and review of control measures following reported work related ill health

7 Roles and responsibilities

7.1 Head of Department

- should nominate a person (usually the Departmental Safety Officer) to implement the vibration regulations within the department and ensure they have the necessary skills and competencies;
- support the nominated person in implementing measures to comply with the vibration regulations;
- ensure that all managers and employees within the department discharge their responsibilities in accordance with this policy

7.2 Managers / Supervisors

- understand the scope of the vibration regulations and where this is relevant to the work area;
- ensure suitable and sufficient risk assessments have been carried out in accordance with relevant statutory requirements and University policy;
- ensure that all vibration risk factors have been included when purchasing of hiring new equipment;
- implement necessary control measures and plan in conjunction with the Departmental Safety Officer (DSO);
- ensure that employees are suitably instructed and trained in all aspects of risk control and associated procedures;
- ensure the regular maintenance of tools is carried out in accordance with an established maintenance programme;
- ensure that all new or transfer employees whose work involves exposure to hand transmitted vibration are referred to and attend occupational health for baseline health surveillance (subject to a suitable risk assessment) - which will continue for the duration of exposure;
- inform the OHS when an employee registered on the health surveillance programme is leaving the University to ensure that exit surveillance is completed and a copy of an individual's health surveillance record available to the employee;
- ensure employees understand and comply with the health surveillance programme;
- employees who do not wish to comply with the programme will not be cleared fit for the task and management informed;
- manage employees who decline to attend for health surveillance;
- investigate, with relevant health and safety officer / DSO and /or occupational health, all HAVS related accidents and ill health;
- if an employee is not fit to work with HAV, remove them from exposure;
- create and maintain a **health record to be kept for 40 years**

7.3 Employee

- use all equipment in accordance with instruction;
- ensure all equipment is well maintained;
- **report any defects or difficulties with equipment**;
- co-operate with and attend the relevant health surveillance programme where a risk assessment has established the requirement;
- report to management and the OHS any possible adverse symptoms or health changes immediately without waiting for the next scheduled health surveillance;
- attend appropriate training in relation to workplace hazards and health surveillance.

7.4 Safety Office

- ensure the guidance is cascaded through the University to prevent ill health and injury at work;
- advise on vibration control measures;

- provide / arrange training for nominated persons e.g., DSOs;
- give support, guidance and training to all University departments e.g., risk assessment process, need for health surveillance;
- investigate with relevant department supervisor / DSO and /or occupational health, all HAVS related reported accidents and ill health as soon as they are reported
- audit compliance
- report RIDDOR cases to the relevant authority i.e., the Health and Safety Executive (HSE)
- Inform the University Insurance Manager

7.5 Occupational Health

- begin health surveillance programmes for employees who, following risk assessment, require it; this may take the following format:
  - questionnaire
  - interview
  - specific tests
  - medical examination
  - a combination of the above
- assist with the protection of employees' health by detecting as early as possible adverse changes to health, likely to be associated with exposure to vibration;
- implement specific surveillance programmes for employees identified through the risk assessment process as requiring health surveillance;
- assist with identifying the control measures advised;
- provide adequate information and advice to the individual on annual basis and encourage full co-operation with the health surveillance programme;
- provide clinical assessment and diagnosis;
- advise management on the appropriate control of employees diagnosed with HAVS or vibration-related ill health;
- audit compliance;
- investigate with relevant department supervisor / DSO and /or occupational health, all HAVS related reported accidents and ill health;
- with the informed consent of the individual, advising managers and the health and safety office when a vibration-related disorder is diagnosed by an occupational physician or treating doctor and requires reporting under the Reporting of Diseases and Dangerous Occurrences Regulations (RIDDOR) 1995;
- collect and collate data to:
  - provide anonymised group information from health surveillance
  - review health surveillance data against environmental and individual monitoring results
  - advise regards any identified health and safety intervention requirements.

Sources / further reading

Control of Vibration at Work Regulations 2005 (L140) HSE Books

Management of Health and Safety at Work Regulations 1999 Approved Code of Practice and Guidance L21 (2nd Ed)

Hand-arm vibration at work – HSE pages
http://www.hse.gov.uk/vibration/

Health Surveillance for Hand-arm vibration syndrome advice for employers – HSE pages http://www.hse.gov.uk/vibration/hav/advicetoemployers/havsemployers.pdf

Reporting of Disease and Dangerous Occurrences Regulations (RIDDOR) 2005 http://www.hse.gov.uk/riddor/

University Safety Office guidance –
http://www.safety.admin.cam.ac.uk/publications

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