Memo M5/21

**The Control of Vibration at Work Regulations 2005; Hand-Arm Vibration**

**Introduction**

Hand-arm vibration (HAV) is vibration transmitted into the hands and arms from the use of hand-held power tools (such as grinders and strimmers), or through contact with materials that are vibrating, such as during cutting. Regular and frequent exposure can lead to a range of conditions known as hand-arm vibration syndrome (HAVS) and carpal tunnel syndrome (CTS). Symptoms include tingling, numbness, pain and weakness in the hand and the fingers going white (blanching), and becoming red and painful on recovery.

The Control of Vibration at Work Regulations require the risk of exposure to vibration at work to be either eliminated at source, or where this is not reasonably practicable, reduced to as low as is reasonably practicable.

The purpose of this memo is to:

* Highlight the requirement to identify and manage the risks from hand-arm vibration in the University;
* Assist departments in identifying equipment that might present a risk and provide information on how to assess and manage that risk;
* Identify areas that present a high risk, so the Safety Office can provide support in ensuring the risks are appropriately managed.

**Actions for departments**

1. Discuss this memo in your departmental safety advisory committee.
2. Undertake a survey to find out who is exposed to hand-arm vibration, what is causing the exposure and how long the equipment or work piece is being held for.
3. Where there is exposure, undertake a risk assessment and document this (detail commensurate with risk).
4. Implement the control measures identified with reference to Appendix A. This should include staff instruction, information and training and ensuring all staff who are likely to be exposed at or above the Exposure Action Value (or where an individual risk factor is identified such as a diagnosis of HAVs) are under Health Surveillance with the Occupational Health Service.
5. Inform the Safety Office [enquiries@safety.ox.ac.uk](mailto:enquiries@safety.ox.ac.uk)  where:

* widely varying daily combinations of different pieces of hand-held vibrating equipment are used; and/or
* high risk equipment or combinations of equipment have been identified (when gauged by vibration magnitude and trigger time), in particular where the Exposure Action Value is likely to be approached or exceeded; and/or
* very old equipment is being used that has not been maintained or has been poorly maintained.

The Safety Office will be able to provide further information and support where necessary.

1. Include HAVs in departmental health and safety management arrangements, as is appropriate to the risk (for example risk register, prioritised action plan, assurance checking).

**Responsibilities**

* **Heads of department** are responsible for ensuring these actions are implemented.
* **Supervisors** are responsible for implementing them within their areas of control.
* **Departmental safety officers** should support their head of department and supervisors by providing advice and helping to coordinate or oversee the actions.

**How to identify HAV equipment**

Examples of equipment used in the University might include: hand-held drills, chipping hammers, sanders, grinders, disc cutters, chainsaws, brush cutters, hedge trimmers, and powered mowers. There may be equipment not immediately obvious such as hand-held vortex machines used in laboratories and pressure washers used for cleaning. Vibration can also be transmitted when workers hold work pieces which vibrate while being processed by powered machinery, such as pedestal grinders. Grounds management, workshops, facilities management, caretaker and maintenance activities are examples of work that can be expected to use HAV equipment. More information can be found at [Hand arm vibration - Advice to Employers (hse.gov.uk)](https://www.hse.gov.uk/vibration/hav/advicetoemployers/index.htm#problem).

**Assessing the risks**

The level of exposure to vibration is a combination of the amount of vibration the equipment produces (vibration magnitude) and the time the equipment is used for (trigger time). Trigger time is a key factor in assessing the risk. The effect of trigger time can be illustrated when considering two different pieces of equipment: a drill and a strimmer. A drill tends to be used for a few seconds at a time and used occasionally or a few times throughout the day (depending, of course, on the jobs in hand), where as a strimmer would be more routinely used for prolonged periods. The strimmer will *generally* present a much higher risk when considering the trigger time and it will be more important that the vibration magnitude it produces is low.

The Vibration Regulations include an exposure action value (EAV) and an exposure limit value (ELV) based on a combination of the vibration at the grip point(s) on the equipment or work-piece and the time spent gripping it. The exposure action and limit values are:

* a daily EAV of 2.5 m/s2 A(8) that represents a clear risk requiring management; and
* a daily ELV of 5 m/s2 A(8) that represents a high risk above which employees should not be exposed.

These values are cumulative during the day, so account needs to be taken of different pieces of HAV equipment used throughout that day.

The vibration magnitude of a piece of equipment should be provided by manufacturers. Typical values can also be found in the HSE guidance [Microsoft Word - Sources of vibration magnitude data - word version - webpage (hse.gov.uk)](https://www.hse.gov.uk/vibration/hav/source-vibration-magnitude-app3.pdf). It should be noted that these values assume equipment is well maintained and serviced, in accordance with manufacturer’s instructions; poor maintenance of equipment can significantly increase the vibration produced.

Once you have the vibration magnitude you can use the simple exposure points system to gauge whether you might have a problem.

**Simple 'exposure points' system**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Tool vibration (m/s2)** | 3 | 4 | 5 | 6 | 7 | 10 | 12 | 15 |
| **Points per hour (approximate)** | 20 | 30 | 50 | 70 | 100 | 200 | 300 | 450 |

Multiply the points assigned to the tool vibration by the number of hours of daily 'trigger time' for the tool(s) and then compare the total with the exposure action value (EAV) and exposure limit value (ELV) points.

100 points per day = exposure action value (EAV)

400 points per day = exposure limit value (ELV)

**If daily exposure is approaching (or exceeding) the EAV** departments will need to work out more accurate figures using the HSE exposure calculator, [Hand arm vibration - Exposure Calculator (hse.gov.uk)](https://www.hse.gov.uk/vibration/hav/vibrationcalc.htm). Departments will need to:

* put in place a programme of organisational and technical measures to reduce exposure to as low as reasonably practical;
* ensure staff are [registered for health surveillance with the Occupational Health Service](https://occupationalhealth.admin.ox.ac.uk/health-surveillance);
* ensure staff receive suitable information, instruction and training on the risks and control measures. The following information will be helpful: [Safety Office E-Learning course](https://cosy.ox.ac.uk/accessplan/LMSPortal/UI/Page/Courses/book.aspx?courseid=SAFEEL0017) and HSE guidance [Hand arm vibration - Advice for employees (indg296 - rev1) (hse.gov.uk)](https://www.hse.gov.uk/vibration/hav/indg296.htm).

Control measures will include selecting the correct equipment, ensuring it is serviced and maintained, having a regular replacement policy, scheduling work to keep exposure below the EAV and providing suitable gloves, where appropriate, to keep hands warm. Full information on the range of control measures to be considered and implemented are contained in **Appendix A**.

Even if exposure does not approach the EAV, departments should still look to eliminate exposure to hand-arm vibration at source, or where this is not reasonably practicable, reduce exposure to as low a level as is reasonably practicable.

7 July 2021 Dr C Williams

CIRC: A, C, H, MPLS, O, S: Heads, Admins, DSOs1, DSOs2, List V

**Appendix A: control measures**

**Alternative work methods**

* Look for alternative work methods that eliminate or reduce exposure to vibration. Trade associations, other industry contacts, equipment suppliers and trade journals may help you identify good practice in your industry.
* Mechanise or automate the work.

**Example:** use a breaker attachment on an excavating machine to break concrete rather than using a hand-held breaker.

**Equipment selection**

* Make sure that equipment selected or allocated for tasks is suitable and can do the work efficiently. Equipment that is unsuitable, too small or not powerful enough is likely to take much longer to complete the task and expose employees to vibration for longer than is necessary.
* Select the lowest vibration tool that is suitable and can do the work efficiently.
* Limit the use of high-vibration tools wherever possible.

**Example:** to cut large holes in brickwork, use a diamond-tipped hole-cutting drill bit with a rotary action rather than a tungsten-tipped hole bit which requires rotary and hammer action.

**Purchasing policy for replacing old equipment and tools**

Work equipment is likely to be replaced over time as it becomes worn out and it is important that you choose replacements, so far as is reasonably practicable, which are suitable for the work, efficient and of lower vibration.

* Discuss your requirements with a range of suppliers.
* Check with suppliers that their equipment is suitable and will be effective for the work, compare vibration emission information for different brands/models of equipment, ask for vibration information for the way you plan to use the equipment and ask for information on any training requirements for safe operation.
* Get your employees to try the different models and brands of equipment and take account of their opinions before you decide which to buy.
* Find out about the equipment's vibration reduction features and how to use and maintain the equipment to make these features effective.
* Make sure your organisation has a policy on purchasing suitable equipment, taking account of vibration emission, efficiency and your specific requirements.
* Train purchasing staff on the issues relating to vibration so that they can deal effectively with equipment suppliers.

**Example:** If a breaker has vibration-isolating handles, check how the machine must be operated to ensure the reduced vibration levels are achieved in use and ensure your operators have the necessary training.

**Workstation design**

* Improve the design of workstations to minimise loads on employees' hands, wrists and arms caused by poor posture.
* Use devices such as jigs and suspension systems to reduce the need to grip heavy tools tightly.

**Example:** where a heavy grinder is used at a permanent workstation to do repetitive work, suspend it from a counterbalance system to reduce the load on the operator's arms and the tightness of grip needed.

**Maintenance**

* Introduce appropriate maintenance programmes for your equipment to prevent avoidable increases in vibration (following the manufacturer's recommendations where appropriate).
* Do not use blunt or damaged concrete breaker and chipping hammer chisels and replace consumable items such as grinding wheels, so that equipment is efficient and keeps employee exposure as short as possible.

**Example:** check and sharpen chainsaw teeth regularly (following the manufacturer's recommendations) to maintain the chainsaw's efficiency and to reduce the time it takes to complete the work.

**Work schedules**

* Limit the time that your employees are exposed to vibration.
* Plan work to avoid individuals being exposed to vibration for long, continuous periods – several shorter periods are preferable.
* Where tools require continual or frequent use, introduce employee rotas to limit exposure times (you should avoid employees being exposed for periods that are long enough to put them in the high risk group (above the ELV)').

**Example:** Organise employees to work in teams where they switch tasks within the team to avoid individuals having unnecessarily high exposure to vibration.

**Clothing**

* Provide your employees with protective clothing when necessary to keep them warm and dry. This will encourage good blood circulation which should help protect them from developing vibration white finger.
* Gloves can be used to keep hands warm, but should not be relied upon to provide protection from vibration.