Control of Vibration at Work Procedure

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CONTROL OF VIBRATION AT WORK PROCEDURE

Introduction

The purpose of this procedure is to ensure safe systems are devised and implemented to support the commitment made by the University to protect employees who are exposed to work related vibration, so far as is reasonably practicable, from the risks associated with Hand-Arm Vibration Syndrome (HAVS) and whole-body vibration, to meet the requirements of legislation.

The Control of Vibration at Work Regulations (2005) outline the legal requirements concerned with the protection of persons against risk arising from work-related exposure to vibration and complements the general requirements to manage risks under the Management of Health and Safety at Work Regulations (1999).

What is Hand-Arm Vibration Syndrome (HAVS)?

HAVS is a condition that has the potential to severely and permanently affect any employee who uses powered hand-tools or equipment. Any employee who is regularly and frequently exposed to high vibration by holding and/or operating vibrating equipment may suffer from permanent health effects. Symptoms include tingling and numbness in the fingers, pain, reduced sense of touch and temperature, carpel tunnel syndrome and episodic blanching of the fingers.

The effects of HAVS are cumulative which can ultimately lead to loss of manual dexterity, resulting in clumsiness and reduced grip strength, affecting their ability to work safely. In severe cases, blood circulation may be permanently impaired, and fingers may take on a blue-black appearance.

There is no cure for HAVS, so prevention is vital. Once the damage is done it is permanent. HAVS can be serious and disabling to a worker and affect their ability to do fine/manipulative work and cold can trigger painful blanching attacks. There are simple and cost-effective ways to reduce and/or eliminate the risks of HAVS. Health surveillance is vital to detect and respond to early signs of damage. The risk depends on the extent of the vibration and how long an employee is exposed to it.

Whole-Body Vibration

Whole-body vibration (WBV) is transmitted through the seat or feet of employees who drive mobile machines, or other work vehicles, over rough and uneven surfaces as a main part of their job. Large shocks and jolts may cause health risks including back-pain. Drivers of some mobile machines, including certain tractors, forklift trucks and quarrying or earth-moving machinery, may be exposed to WBV and shocks, which are associated with back pain.

Responsibilities

Deans of Faculty / Directors / Heads of Department

Responsible for all health and safety within their Faculty or Department and therefore, must ensure risk assessments are completed. This includes vibration risk assessments and allocating sufficient resources for all control measures required by the risk assessment.

Supervisors, Line Managers, Directors of Studies and Academic Leads

Responsible for ensuring the day-to-day supervision of health and safety matters in their areas of responsibility and therefore must:

- Carry out, or ensure the carrying out, and monitor/review of all applicable risk assessments including the risk from vibrating tools or vehicles.
- Communicate the risk assessment to all affected parties.
- Bring this procedure to the attention of direct reports working with equipment that produces high levels of vibration.
- As required, provide suitable and sufficient training and PPE to protect against vibration.

Health and Safety Champion

Act as the focal point for health and safety within their school or department and as such must:

Bring any concerns reported to them, and related to vibration, to the attention of the Faculty or Department Health and Safety Committee as appropriate. Any urgent concerns should be raised with the Dean of Faculty / Head of Department immediately.

Individual Users

Staff and Students have a responsibility for their own health and safety and that of others, and therefore must:

- Take care of themselves and others who could be affected by their actions and omissions.
- Adhere to the control measures identified in Risk Assessments.
- Report any significant safety issues to their Line Manager promptly.

Definitions

- Hand Arm Vibration (HAV): Mechanical vibration transmitted from work processes into an employee's hands and arms.

- Whole Body Vibration (WBV): Mechanical vibration which is transmitted into the body when seated or standing, through the supporting surface.

- Handheld Equipment: pedestrian lawn mowers, hedge cutters, strimmers, and backpack blowers.

- Exposure Action Value (EAV) – 2.5 m/s^2 A(8) (exposure averaged over a day) Wherever exposure at or above this level occurs, actions (including health surveillance) are required to control the risk.

- Exposure Limit Value (ELV) – 5 m/s^2 A(8) (exposure averaged over a day) This is the maximum vibration exposure permitted for any individual on a single day.

- Trigger time – it is the actual time an employee's hands are in contact with the equipment, not the overall time it takes to complete the job.

Note: m/s^2 – represents metres per second squared.

Vibration Risk Assessment

Line Managers have a responsibility to carry out risk assessments for all staff under their remit.

Personal Tutors and Programme Leaders have responsibility for students whether within the University campuses or on any field or study trips.

Full training is available via the University Training Portal. We have a dedicated course called "Your Role as a Manager & Risk Assessment" which incorporates how to complete a risk assessment.

For full details please contact HealthandSafety@uws.ac.uk for more information.

The risk assessment enables managers to make a valid decision about the measures necessary to prevent or adequately control the exposure of employees to HAV or WBV. It also facilitates managers to demonstrate to others who may have an interest, e.g. employees, safety representatives and enforcement authorities that they have from the earliest opportunity considered the risks from vibration.

The steps below provide the sequence of steps to carry out when conducting a risk assessment:

Step 1: Identify any areas, processes, machinery or equipment where vibration generated could give rise to a risk to health, identify all persons likely to be exposed, and identify the length of time persons are exposed for. Data sheets supplied with equipment should be reviewed to provide vibration data.

Step 2: Review and observe the conditions under which such powered tools, equipment and machinery are used to obtain a true and representative appreciation of the nature of the work. Seek advice from the Health & Safety team where a potential risk has been identified.

Step 3: Have a competent person carry out a risk assessment. Identify the maximum duration of their use ('trigger time' for HAVS or work time for WBV) in any working day, if necessary, by keeping a log or using monitoring devices. Any work activities that have been identified as likely to exceed:

Hand-Arm Vibration (HAVS) Values:

- Exposure Action Value (EAV) (2.5 m/s^2 A(8) – this triggers action and health surveillance.

- The Exposure Limit Value (ELV) (5 m/s^2 A(8) - this is the maximum legal daily amount which must not be exceeded.

Whole-Body Vibration (WBV) Values:

- Exposure Action Value (EAV): (0.5 m/s^2 A(8) - requires risk reduction and management.

- Exposure Limit Value (ELV): (1.15 m/s^2 A(8) - maximum legal daily limit for seated or standing posture.

Step 4: Provide technical and organisational measures to eliminate or reduce as far as is reasonably practicable the identified risks. This should include control of the vibration at source, at the receiver and in transmission.

Step 5: Consider individual factors such as pre-existing health conditions that may increase risk from vibration exposure for individual employees. Ensure that employees use equipment correctly. Poor posture, technique etc. may increase vibration exposure from a particular activity by up to 50% compared to colleagues.

Step 6: Classify tasks where vibration exposure is likely to be above the Exposure Limit Value (5 m/s^2 A(8). Refer persons to UWS Occupational Health where exposure is significant, e.g. routinely exceeding the Exposure Action Value (EAV) (2.5 m/s^2 A(8) or where susceptible individuals may be exposed between the Exposure Action Values and Exposure Limit Value.

Step 7: Provide information, instruction, training and supervision.

Step 8: Record and review the assessment.

The risk assessment should identify the maximum trigger time, or usage time permissible for the equipment to ensure that exposure does not exceed the ELV. The risk assessment should detail the measures in place to reduce the risk from vibration exposure and where applicable may include an Action Plan indicating any further measures planned. The vibration risk assessment can be a standalone document or can be incorporated into a task specific risk assessment document for a department or process where this is more appropriate. Risk Assessment templates can be found here.

The risk assessment should be reviewed whenever there is a change in vibration exposure or otherwise at least every 2 years.

Control of Exposure to Vibration

Measures should be put in place to reduce vibration exposure to as low a level as is reasonably practicable – even if vibration levels are below the Exposure Action Value (EAV), consideration should be given as to whether further reduction is practical.

Personal vibration exposure **must not** exceed the Exposure Limit Value (ELV) of 5m/s^2. On very limited occasions, employers are allowed to average exposures over a week rather than over a day, but only in particular circumstances. This is primarily designed for where workers exceptionally need to carry out work causing uncommonly high vibration exposure in a single day, e.g. for emergency work.

The main conditions are:

- that the person's exposure is usually below the exposure action value.
- that the risk is less than if the employee were exposed at the exposure limit value for the week.

This flexibility does not remove the duty on the employer to reduce the exposure so far as is reasonably practicable. Measures to reduce risks from vibration exposure may include replacing tools and equipment with alternatives which produce lower magnitudes of vibration.

The vibration dose received by the worker over a typical working day depends on the duration of exposure as well as the vibration magnitude. To allow different exposure patterns to be compared they are adjusted or normalised to a standard reference period of 8 hours. The Control of Vibration at Work Regulations 2005 describe how an exposure normalised to 8 hours, A(8), can be calculated. The table below gives the average vibration levels over a working day and the times to reach the exposure levels.

Vibration Magnitude (m/s^2)	**2.5**	**3.5**	**5**	**7**	**10**	**14**	**20**
Time to reach exposure action value (in hrs)	8	4	2	1	1/2	1/4	8 mins
Time to reach exposure limit value (in hrs)	>24	16	8	4	2	1	1/2

The table below lists some indicative vibration values for typical equipment. Please note, these are purely for **guidance only**. Vibration levels will differ significantly between different manufacturers, the size of the equipment, the age of equipment and how well it has been maintained.

Examples of Equipment	**Typical Vibration Levels (m/s^2)**
Angle Grinder	5.9
Hammer Drill	9.0
Chainsaw	7.0
Hedge Trimmer	5.2

For example, a chainsaw with a vibration level of 7 m/s^2 would result in exposure of the operator to the equivalent of the EAV in just one hour, hence typical use greater than this would require reasonably practicable exposure reduction measures to be taken. If this was used for 4 hours a day the ELV would be exceeded and no further use would be permitted.

HSE – Hand-Arm Vibration Calculator

The Health and Safety Executive have produced a Hand-Arm Vibration Exposure Calculator which will enable conversion of working times and vibration magnitudes into an overall exposure factor. The hand-arm vibration exposure calculator can assist in calculating exposures. Before using the calculator read the information and guidance provided in the link above. The exposures for different combinations of vibration magnitude and exposure time are given in exposure points instead of values in m/s^2 A(8). You may find the exposure points easier to work with than the A(8) values:

- Exposure points change directly proportional with time e.g. double the exposure time = double the number of points.
- Exposure points can be added together, for example where a worker is exposed to two or more different sources of vibration in a day.
- The Exposure Action Value (2.5 m/s^2 A(8)) is equal to 100 points.
- The Exposure Limit Value (5 m/s^2 A(8)) is equal to 400 points.

Where a person is exposed to more than one source of vibration (perhaps because they use two or more different tools or processes during the day) the exposure must initially be calculated separately for each one. This produces two or more partial vibration exposure points values These partial exposures points values are added together to provide a total exposure points value for that employee.

Work Practices

It is important to ensure that work activities are designed to consider ergonomic principles, and to:

- Encourage good posture and working techniques.
- Ensure correct selection of the most appropriate tools for the task.
- Ensure that all equipment is properly maintained.
- Minimise time exposed to vibration e.g. Regular breaks, job rotation etc.
- Provide suitable clothing to protect employees from cold and damp.
- Provide suitable training and information for all those exposed to vibration.

Training

Where new staff are employed and are likely to be exposed to vibration levels above of the EAV, they should be made aware of the risks of vibration prior to first exposure, or at least within the first week of employment. This can be done at the same time as asking them to complete the initial health assessment form for return to Occupational Health.

In addition, all employees should be given appropriate training in the use of equipment. This should include periodic supervised practice to identify work practices which may increase risk such as poor postures, gripping equipment too tightly etc. The risk assessment will contain relevant information identifying the tools posing vibration risks, Exposure Action and Limit Values, control measures including PPE requirements, how to recognise and report symptoms and the importance of health surveillance.

The employees' duties are; to:

- Follow instructions provided on safe working practices.
- Report problems with their equipment such as unusually high vibration levels.
- Co-operate with the programme of control measures and health surveillance.

Maintenance of Equipment

In order to minimise the deterioration of equipment, items should be inspected and serviced on a regular basis. Manufacturer’s advice should be considered. There may be certain routine checks or preventative replacement of parts required, in which case these should be carried out at a set frequency.

Individual users must be made aware that if at any point they feel a machine performance has deteriorated in terms of vibration, they must report it at the earliest opportunity so that further investigations can be made.

Health Surveillance

Health surveillance is carried out by the Occupational Health Service and is mandatory for employees who are regularly exposed to vibration above the Exposure Action Value (EAV=2.5. m/s^2).

Health surveillance is also offered to those exposed below the EAV if they are at increased risk e.g. if they report a pre-existing diagnosis of HAVS or any other condition of the hands, arms, wrists or shoulders, or any condition which affects circulation or nerve conduction such as diabetes, carpal tunnel syndrome etc.

Where any member of staff has been identified as being at risk, their Line Manager should notify UWS Occupational Health to allow them to be placed on an appropriate Health Surveillance programme. Full details of what is involved will be discussed with the employee at an appointment with Occupational Health.

Health surveillance will involve:

- Initial (baseline) assessment for any new or existing worker before they begin exposure to HAV. This will usually be by completing a questionnaire and information about the hazards of HAVS will be made available to them.
- Annual (screening) assessment by questionnaire sent out to identified individuals. Completed forms should be returned directly and in confidence to Occupational Health.
- Face to face appointments/recall will be arranged if the questionnaire identifies symptoms or if an individual reports symptoms since their last screening.
- Health surveillance usually takes place annually for 2 years then at 3-yearly intervals (although this may be more frequent if any related problem is detected or where the risks are high).
- Workers will be informed of the results following the assessment and of any implications of the findings.
- Individual results will be provided to the referring line manager, and the confidential medical records will be held by Occupational Health. Where appropriate, summary results for groups of employees will be reported back to a manager to indicate the effectiveness of vibration control. Specific recommendations may be made to a manager where an individual employee requires alteration to their duties to protect against HAVS.

When cases of HAVS and carpal tunnel syndrome in association with HAV, are diagnosed by a doctor, they should be reported by the employer in accordance with Regulation 5 and Schedule 3 of the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR), 1995.

Information for employees attending Occupational Health for Health Surveillance can be found on the Occupational Health webpage accessed via People and Organisational Development (P&OD).

References and Further Reading

- *Hand Arm Vibration: The Control of Vibration at Work Regulations 2005. L140*
- *Hand Arm Vibration Advice for Employees (INDG 296 Rev2)*
- *Management of Health and Safety at Work Regulations 1999*
- *Supply of Machinery (Safety) Regulations 2008*
- *Provision and Use of Work Equipment Regulations 1992*
- *Hand-arm vibration at work: A brief guide for employers (INDG175)*