Occupational Vibration Exposure Meeting Kit

What’s At Stake

There are two classifications for occupational vibration exposure: whole-body vibration and hand arm vibration. These two types of vibration have different sources, affect different areas of the body, and produce different symptoms.

What’s the Danger

HEALTH EFFECTS OF EXPOSURE TO WHOLE BODY VIBRATION

Whole Body Vibration (WBV) caused by poorly designed or poorly maintained vehicles, platforms or machinery may cause or exacerbate other health effects such as:

- Lower back pain
- Motion sickness
- Bone damage
- Varicose veins / heart conditions.
- Stomach and digestive conditions.
- impairment of vision, balance, or both.
- reproductive organ damage.

Whole-body vibration (WBV) has been described as a shaking or jolting of the human body through a supporting surface (usually a seat or the floor). The vibration can potentially enter the body via several routes and potentially affect organs and/or human health.

HEALTH EFFECTS OF EXPOSURE TO HAND – ARM VIBRATION

Hand-arm vibration (HAV) is vibration which is transmitted from work processes and equipment into workers’ hands and arms. It can be caused by operating hand-held power tools, such as pneumatic

wrenches, angle grinders, road breakers, and hand-guided equipment.

HAV is caused by regular exposure to high levels of vibration from handheld tools and equipment. It could also be caused by holding materials in contact with grinding or cutting operations.

HOW TO PROTECT YOURSELF

REDUCE AND ELIMINATE RISK FOR WORKERS

If workers are truly at risk from excessive vibration, steps can be taken to reduce or eliminate that risk altogether, including purchasing new tools that vibrate less and maintaining them to a high standard of performance. Some operations will still require the use of tools that are going to produce levels that are considered harmful—it's virtually impossible to design certain types of tools to produce low vibration levels and still be capable of performing their intended task. When that is the case, limiting the amount of time a worker can perform the task is an acceptable alternative, so job rotation may be an option; another is to make sure frequent breaks are taken and hands are kept warm and dry.

Operator technique also can be used to reduce risk of injury, because the amount of grip force used and the way a tool is allowed to "do the work" can limit the amount of vibration energy entering the body (as opposed to "forcing" the tool through the work to attain faster results). For WBV, the type of tires and suspension used on a vehicle are important considerations, as are the seats and their adjustability. Informing workers of the risks and how to avoid or reduce them, as well as empowering them to speak up when a tool becomes worn or damaged, becomes part of an injury prevention program that addresses the long-term risks.

EXPOSURE AND MAGNITADE OF VIBRATION

The amount of risk is driven by time of **exposure and magnitude of the vibration**. The presence of vibration sources, typically hand-held, air-or electrically powered tools, is quickly determined

through an inventory audit of equipment used on site, and a simple study of tool utilization gives a reasonable estimate of time of exposure.

Other risk factors that contribute to the probability of injury include working in cold, damp environments; poor tool maintenance; and even tobacco use. The nicotine found in tobacco products is a known vasoconstrictor that will reduce blood circulation in the extremities even further, which exacerbates the problem and increases risk of irreparable harm. Reports of workers suffering from a tingling sensation in the hands and fingers after using a piece of equipment can be another indicator of risk. If workers are complaining of whitening of the digits followed by a "flushing" effect, or pain and numbness occurring while off the job, the risk may be excessive and could have already resulted in some onset of injury.

TRAIN, TRAIN AND TRAIN

A good training programme will encourage the cooperation of workers and should include issues such as:

- the health effects of hand-arm vibration.
- sources of hand-arm vibration.
- whether employees are at risk, and if so whether the risk is high or low.
- the risk factors (e.g. the levels of vibration, daily exposure duration, regularity of exposure over time.)
- how to recognise and report symptoms.
- changes to working practices to reduce vibration exposure.
- correct selection, use and maintenance of equipment.
- correct techniques for equipment use, how to reduce grip force etc.
- maintenance of good blood circulation at work by keeping warm and massaging fingers.
- Employees need to be advised of the link between smoking, blood circulation and HAV.

BEST WORKER VIBRATION PREVENTION PROTOCOL

- Whole-body vibration levels can often be reduced by using vibration isolation and by installing suspension systems between the operator and the vibrating source.
- Hand and arm vibration may be more difficult to control, but the proper selection and maintenance of tools can dramatically decrease vibration exposure. Vibration levels associated with power hand tools depend on tool properties, including size, weight, method of propulsion, handle location, and the tool drive mechanism.
- Administrative controls can be very important. In high-risk situations, job rotation, rest periods, and reduction in the intensity and duration of exposure can help reduce the risk of adverse health effects.

FINAL WORD

Vibration exposure is more than just a nuisance. Constant exposure to vibration has been known to cause serious health problems such as back pain, carpal tunnel syndrome, and vascular disorders.