Every day, thousands of New Brunswick workers are exposed to hand-arm vibration. Exposure to excessive vibration can result in vibration-related injuries and diseases such as vibration white finger. Beyond the phenomenon and causal related syndrome. In extreme cases, these injuries and diseases can even lead to permanent impairment of the hands and arms. The adverse effect produced by exposure to vibration is called hand-arm vibration syndrome (HAVS). The injuries caused by vibration can result in both human and financial costs. Fortunately, they are preventable.

What is Hand/Arm Vibration Syndrome?

Vibration can be explained as the back and forth motion produced by objects such as tools, machinery and equipment. It has two components: frequency (or repeat rate) and amplitude (or displacement). Any person who operates powered equipment with high frequency vibration or high impact (such as chainsaws, grinders, jackhammers, impact wrenches, or sanders) for extended periods is at risk of HAVS.

What are the Symptoms of HAVS?
The symptoms of HAVS include numbness, tingling, and impaired function of the nerves of the upper limb (polyneuropathy). It may also produce symptoms similar to carpal tunnel syndrome. There may be a musculoskeletal component resulting in joint stiffness in the hands and wrists.

How can HAVS affect your health?
Continuous exposure to excessive vibration will result in construction of blood vessels in the hands and arms, thus reducing or cutting off blood supply to fingers and hands. The reduction in blood supply will cause numbness, swelling and tingling effects. HAVS may also have a neurological component, with impaired function of the nerves of the upper limb producing symptoms similar to carpal tunnel syndrome. There may also be a musculoskeletal component resulting in joint stiffness in the hands and wrists.

The amount of damage to the blood vessels is proportional to the duration of the exposure and the intensity of the vibration. The process is slow and cumulative. When the tissue has been damaged, there may be no noticeable symptoms until the condition becomes advanced. The condition is then irreversible. Any person who operates powered hand tools may be at risk of HAVS.

Who is at risk?

Amplitude is very important in the injury process. Amplitude (or displacement) and frequency (or repeat rate) are both important determinants of the injury process. Amplitude (or displacement) and frequency (or repeat rate) are both important determinants of the injury process. Amplitude is very important in the injury process. Amplitude (or displacement) and frequency (or repeat rate) are both important determinants of the injury process. Amplitude (or displacement) and frequency (or repeat rate) are both important determinants of the injury process.

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What are the Symptoms of HAVS?
The symptoms of HAVS include numbness, tingling, finger blanching, decreased hand sensations and dexterity, and decreased grip strength. An affected person might initially notice one finger that blanches, decreased hand sensation and impaired function. It may be a loss of the sense of touch in the hands and simple tasks, such as buttoning a shirt, may become difficult. Attacks are usually triggered by cold temperatures or contact with cold liquid or soil.

Cold weather and smoking are important aggravating factors. Both increase the risk of HAVS and may precipitate an attack.

Stage              Description

Moderate          Occasional attacks affecting one or more fingers

Severe            Occasional attacks affecting all sections of most fingers

Very severe        As in the severe stage, but with skin alterations in the fingertips

Table 1: Stages of HAVS

Preventive Measures

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HAND-ARM VIBRATION SYNDROME

If vibration is a concern, develop a code of practice for the use of tools, equipment or machinery. The code of practice should include, but not be limited to, the following items:

1. Tool selection (buying anti-vibration tools, choosing the proper tool for the job, etc.)
2. Alternative tools and methods for certain jobs (such as hydraulic tools in place of vibratory tools).
3. Information and training to workers in the proper use and handling of tools and equipment and recognizing HAVS symptoms.
4. Mandatory rest periods (30 minutes or more every hour) for vibratory tool operators.
5. Regular inspections and equipment maintenance.
6. Selection and use of antivibration gear.
7. Pre-placement and periodic medical evaluations of workers exposed to vibration.

Workers who suffer from an advanced stage of HAVS should be removed permanently from the exposure. If exposure is continued, many cases can progress to permanent disability.

Exposure Standards

In New Brunswick, General Regulation 10-281, the Occupational Health and Safety Act requires the use of the 1997 American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) for exposure of the hands and arms to vibration. The Occupational Health and Safety Act requires the use of the 1997 American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) for exposure of the hands and arms to vibration.