

HAND-ARM VIBRATION SYNDROME (HAVS)

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When we think about the hazards of power tools, vibration is not high on our list. However, for many American workers, vibration hazards pose both acute and chronic health problems. Daily exposure to hand and arm vibration by workers who use vibrating tools powered by compressed air, gasoline, or electricity can cause physical damage to the hands and arms. Occupations in which workers are at particular risk include construction, forestry, foundry, quarry, shipyard, railroad, assembly manufacturing, mining, and agriculture.

WHAT IS HAVS?

One of the most common vibration-related problems is *hand-arm vibration syndrome (HAVS)*. While it has been long recognized that vibration affects the hands and arms, it was not until 1983 that scientists agreed on a definition of HAVS. HAVS is a condition which can affect the circulation, sensory, and motor nerves, and can cause muscular-skeletal problems. Also known as “vibration white finger,” “dead finger,” and “Secondary Raynaud’s Syndrome,” HAVS is a condition associated with the destruction of the small blood vessels and with nerve damage in the fingers.

COMMON CAUSES

HAVS was first recognized around 1900 with the introduction of pneumatic tools that were used in quarries and mines. Since then, a multitude of time- and labor-saving hand tools have been developed for practically every major construction, mining, manufacturing, repair, and agricultural task. These powered hand tools include chain saws, grinders, sanders, drills, power hammers, mowers, blowers, and machine tools that expose workers to high levels of vibration.

The primary cause of HAVS is holding high-frequency vibrating tools with the hand. The risk of developing HAVS increases with the magnitude of the vibration and the length of exposure. Other factors include (1) the grip, push, or force used to guide and apply vibrating tools, (2) the pattern of exposure, (3) how much of the hand is exposed to the vibration, (4) cold temperatures, and (5) smoking. All of these factors tend to constrict blood vessels, which in turn restricts blood flow to the affected part of the body.

SYMPTOMS

The effects of HAVS range from mild, short-term “tingling” sensations in the fingers to severe pain and loss of dexterity. Common symptoms include what is known as Raynaud’s phenomenon:

- Whitening (blanching) of fingertips occurs after cold or damp exposure. This is due to the small blood vessels narrowing.
- Bluish discoloration of the skin of fingers and hands occurs as the oxygen is used up from the reduced blood supply of the narrowed blood vessels.
- Fingers turn bright red. This is due to the blood vessels opening up again (or dilating) when proper blood flow resumes. This may cause tingling, throbbing and pain.

The symptoms of Raynaud’s phenomenon can last for minutes or for several hours, and the amount of pain and discomfort varies for each individual. Raynaud’s phenomenon is more likely to occur during the winter, on cold, windy days. This condition can also appear during the summer, though usually when the hands are wet. For some workers, these symptoms develop months or years after finishing work with vibrating tools.

Other symptoms of HAVS may be more permanent in nature if not diagnosed and treated early.

- Numbness, with or without tingling, happens before, during, or after blanching. In severe cases, permanent numbness may extend along affected fingers.
- Sense of touch and pain perception is reduced, sometimes permanently. This condition may prohibit individuals from detecting potential hazardous conditions, such as hot surfaces.
- Decreased grip strength and inability to sustain muscle power can prohibit workers from performing certain required jobs, thus affecting productivity.
- Clumsiness and loss of dexterity not only affect the individual but place co-workers in more danger.
- Permanent blood circulation damage to fingers is possible.
- Permanent blue-black appearance in fingers occurs in severe cases.

HAVS can pose considerable safety risks to affected workers. Loss of grip strength, for example, can cause a worker to drop an object, putting the worker and co-workers at risk of injury. Loss of dexterity in the hands may increase the potential for accidents while performing inherently dangerous tasks. In addition, HAVS can seriously interfere with home activities and hobbies, reducing the quality of life.

PREVENTION AND TREATMENT

The severity of symptoms generally dictates the level of treatment, though taking measures to prevent HAVS is the best medicine. Following are several steps to prevent workers who use vibrating tools from developing HAVS.

Prevention Tips

- Hold tools as loosely as possible and in varying positions.
- Ensure tools are properly maintained.
- Use tools correctly, and use the right tool for the job. If the tool requires excessive grip force or requires long exposure to complete the job, then consider using a more appropriate tool.
- Use anti-vibration gloves.
- Take regular breaks of at least 10 minutes away from the tool. Short bursts of intense work are better than long periods of work without a break.

- Keep hands warm and blood flowing to fingers as much as possible.
- Do not smoke. Chemicals in tobacco can inhibit proper blood circulation.

Treatment

If you use high-frequency vibrating power tools and experience any of the symptoms listed previously, **see your doctor**. Also, report these symptoms to your employer. It is your employer's responsibility to ensure that you work in a safe environment. If symptoms are severe, refrain from using vibrating tools until you receive medical attention.

HAVS symptoms vary for each individual depending on the level and length of exposure to vibrating tools. Thus, treatment options will also vary. However, if you suspect that you have HAVS, the following recommendations may help to minimize short-term effects and prevent long-term disabilities.

- Purchase low-vibrating tools. Check with product manufactures to determine the vibration level compared to similar tools.
- Limit exposure to vibrating tools. Take frequent breaks, warm fingers, and return normal blood circulation to hands and fingers.
- Investigate alternative tools or methods to complete tasks. Inform management of the need for modification.
- Talk to your doctor about prescribed medicine. Some medicines, such as beta-blockers and anti-migraine medicines, cause blood vessels to narrow, making the symptoms of HAVS worse.
- Stop smoking. The chemicals in tobacco can cause the small blood vessels to narrow, making symptoms of HAVS more severe.
- Change jobs. In severe cases where damage is progressing, the best solution may be to remove yourself from the exposure completely.

***DON'T IGNORE THE SYMPTOMS.
CONTACT YOUR DOCTOR AND NOTIFY
YOUR EMPLOYER.***

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