



# I cannot hear you, my hands are numb!

By Michael H. Weier • May 21, 2015

Hand numbness and pain due to use of vibratory tools and hearing loss caused by noise exposure are typical occupational complaints of workers. Though seemingly independent and unrelated, recent research suggests an association.

Raynaud's Phenomenon<sup>1</sup> is condition characterized by pale blue-white skin tone and numbness of the digits of the hands and feet. In Raynaud's, the capillaries that supply blood to the skin constrict and limit blood circulation to affected areas.<sup>2</sup> The fingers or toes may turn blue due to lack of oxygen to the tissues or blue due to lack of blood flow. Use of hand-held vibrating tools that cause or exacerbate Raynaud's is referred to as vibration-induced white fingers (VWF).<sup>3</sup>

## Raynaud's Phenomenon



1. Fingers can become white due to the lack of blood flow

2. The fingers may turn blue as the blood vessels dilate to keep the blood in the tissues

3. Finally the fingers may turn red as the blood begins to return



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Sensorineural hearing loss is a condition due to damage of the small hair cells of the inner ear as a result of excessive noise exposure.<sup>4</sup>

The *American Journal of Industrial Medicine* reported results from a 21-year cohort study that examined the hearing status, hand-arm vibration exposure, smoking habits, age and two-way interactions of the independent variables of 184 workers.<sup>5</sup>

The research reveals that workers with VWF who use vibratory tools in loud work environments are at increased risk for hearing loss. Noise exposure was not the sole cause of hearing loss. Rather, the results suggest *combined exposure* to loud noise and use of vibratory tools causes hearing loss that is greater than noise exposure alone.

The association between use of vibratory tools and increased hearing loss is not clearly understood. The vibrations could cause small capillaries to constrict and reduce blood flow, or directly damage the microscopic hair cells that

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## VWF and hearing loss (continued)

transmit electrical signals to the auditory nerve. Regardless, the research shows a correlation between use of vibratory tools in high noise environments and increased hearing loss.

Employers of workers that use hand-held vibratory tools in loud environments should require use of hearing protection to reduce noise exposure and implement job assignment rotation to limit hand vibration exposure. Otherwise, workers exposed to loud noise and hand vibratory tools may allege increased levels of occupational hearing loss. ■

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<sup>2</sup> Raynaud's Phenomenon is also called Raynaud's, Raynaud's Disease, Raynaud's Syndrome and White Fingers.

<sup>2</sup> *Diseases and Conditions: Raynaud's Disease*, Mayo Clinic, <http://www.mayoclinic.org/diseases-conditions/raynauds-disease/basics/definition/con-20022916>; *Raynaud's Phenomenon*, MedicineNet, (see [http://www.medicinenet.com/raynauds\\_phenomenon/article.htm](http://www.medicinenet.com/raynauds_phenomenon/article.htm)); Raynaud's Phenomenon – Topic Overview, WebMD (see <http://www.webmd.com/arthritis/tc/raynauds-phenomenon-topic-overview>).

<sup>3</sup> Vibration Syndrome, Centers for Disease Control, National Institute for Occupational Safety and Health, (see <http://www.cdc.gov/niosh/docs/83-110/>); *Vibration - Health Effects*, Canadian Centre for Occupational Health and Safety, [http://www.ccohs.ca/oshanswers/phys\\_agents/vibration/vibration\\_effects.html](http://www.ccohs.ca/oshanswers/phys_agents/vibration/vibration_effects.html)

<sup>4</sup> For more information on sensorineural hearing loss, please see my blog post, *WHAT'S THAT YOU SAY? Future treatments may reverse hearing loss*, January 20, 2015 (see <http://rwwcomplaw.com/whats-that-you-say-future-treatments-may-reverse-hearing-loss/>).

<sup>5</sup> Pettersson, H., et al, *Risk of hearing loss among workers with vibration-induced white fingers*, Am J Ind Med, 2014 December (see <http://www.ncbi.nlm.nih.gov/pubmed/25348822>).

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