

6 St Andrew's Place  
Regent's Park  
London NW1 4LB  
Tel. 020 7317 5898  
Fax 020 7317 5899  
Email: admin@bohrf.org.uk  
Web: www.bohrf.org.uk

**Trustees:**

Sir Bill Callaghan  
Professor David Coggon OBE  
Dr Neil Davies  
Mrs Jacqueline Douglas  
Dr David Murray Bruce  
Mr Giles Quartly  
Mr Hugh Robertson  
Dr Alister Scott  
Surg Cdre J J W Sykes  
Mr Richard Tapp

**Scientific Adviser:**

Professor Tony Pickering

**Patrons:**

Lord Hunt of Wirral MBE  
Tim Boswell MP

**Chief Executive:**

Brian Kazer

## Introduction

BOHRF was very pleased to co-fund, with the EEF, the evidence review on hand arm vibration syndrome. Together BOHRF and EEF provided partnership funding with the project leaders, The Faculty of Occupational Medicine. As BOHRF is committed to reaching key target audiences, the production of a leaflet, free of charge for managers and workers, giving a summary of the evidence was a condition of BOHRF funding. That summary is reproduced here as a free contribution to help managers and workers operate from an evidence base in managing health risks associated with the use of equipment that can transmit vibration through the fingers and hands.

The cost of this summary was generously sponsored by GSK. Funding contributions to the £40,000 BOHRF co-funding of the evidence review were generously made by Transco and by the HSE. The balance of our co-funding was met from our Sponsor donations.

---

## Summary Of The Evidence Review On Hand Arm Vibration Syndrome: Summary For Managers And Workers

Hand transmitted vibration (HTV) is one of the commonest hazards to which working people in industrialised countries are exposed. Frequent exposure can cause a range of permanent injuries to hands and arms known collectively as hand arm vibration syndrome (HAVS). The syndrome has two main components, one affecting the circulation of blood to the fingers, commonly known as vibration white finger (VWF), the other affecting sensation in the fingers. This leaflet summarises the results of a recent review of the scientific evidence on HAVS<sup>1</sup>. The review sought to answer some key questions about the diagnosis and practical management of this important condition. The information in this leaflet is intended for use by line managers and workers in the context of occupational health care, rather than for medico-legal purposes.

---

<sup>1</sup> *Clinical Testing and Management of Individuals Exposed to Hand Transmitted Vibration. An Evidence Review.* Faculty of Occupational Medicine 2004. ISBN 1 86016 203 7

## **What are the hazards of Hand Transmitted Vibration?**

There is strong evidence that HTV can lead to:

- Damage to the nerves of the hands and fingers causing numbness and tingling as well as loss of sensitivity, manual dexterity and grip strength (sensory or sensorineural symptoms)
- Impaired blood supply to the hands and fingers typically shown by cold induced episodes of whitening of the fingertips (circulatory or vascular symptoms)
- Carpal tunnel syndrome - pain in the wrist with loss of power and sensation in the hand.
- There is moderate evidence that HTV can lead to:
- Dupuytren's disease - a deformity of the palm and fingers.
- The evidence is weak, contradictory or non-existent for HTV causing:
- Musculo-skeletal disorders of the upper limb, shoulder or neck.

## **Who is most at risk?**

Anyone using hand held power tools, hand guided machinery or holding materials being processed by machines. This includes industries traditionally associated with vibration injury such as mining, stone-masonry, engineering and forestry, and other occupations like car mechanics and construction workers. There is some evidence of risk to users of high-speed drills in medical/dentistry work as well as operators of high pressure water hoses and motor cycle riders. There is great variation in the vulnerability of individuals to vibration. This makes it hard to predict the amount of vibration that will harm an individual.

It is possible to identify types of tools which are more hazardous. These include rock drills, chain saws, concrete breakers, strimmers, chipping hammers, needle guns and portable grinders. Tasks which require a stronger grip when using vibrating tools may increase the risk of HAVS. ISO 5349 is designed to help with assessing which kinds of tools are most hazardous. An Internet database for exposure levels on hand-held vibrating tools is available (<http://umetech.niwl.se>).

There is consensus among doctors that people with pre-existing damage to the nerves or blood supply to the hands should not be exposed to HTV. In those exposed to HTV, cold and damp climates are associated with more circulatory symptoms than in warm climates. The evidence to suggest smoking as a risk factor is inconclusive but smoking itself reduces circulation of blood to the fingers and should be discouraged.

## **Is there a safe level of exposure?**

There is some evidence showing the risk of HAVS to be insignificant below  $1\text{m/s}^2$ . However exposure at either the current UK action level or the new EU limit and action levels may still result in some individuals developing HAVS, or in the deterioration of the symptoms of someone with HAVS. Exposure to HTV should therefore be reduced as low as is reasonably practicable. Health surveillance has an important role to play in monitoring the effectiveness of exposure levels.

## **How do we find out if someone has HAVS?**

A clinical assessment by an appropriately trained health professional is required and this may need to be supplemented by special investigations. The assessment should include:

- Record of past exposure to vibration, including that from previous employment and non-occupational sources.
- Medical history, including smoking habits, and other diseases which may mimic the symptoms of HAVS.
- Symptoms suggestive of HAVS including those occurring only in the cold.
- Physical examination.

The severity of symptoms is most commonly graded using the Stockholm Workshop Scale. This separates the symptoms into two independent categories: the circulatory or vascular component and the sensory or sensorineural component. The vascular component is graded from Stage 0 (no symptoms) to Stage 4 (very severe symptoms), and the sensorineural component from Stage 0 (no symptoms) to Stage 3 (very severe symptoms). Despite some limitations, the Scale is the recommended means of grading the severity of HAVS.

There is no single investigation or specialist test which can accurately diagnose or stage HAVS. Referral for specialist examination including vascular and sensory tests may be necessary for more severely affected cases only, or where continued fitness for work with HTV is uncertain.

#### **How often should health surveillance be done?**

Given the difficulty of predicting "safe" levels of HTV for an individual, health surveillance is an important element in an organisation's overall programme for managing exposure. The general view is that workers at risk of HAVS should have an annual check with a questionnaire, and if necessary an examination. Workers who have a more severe problem should be checked more frequently following advice from an appropriately trained health professional. This advice will largely be based on the stage the worker has reached on the Stockholm Workshop Scale.

#### **Can affected workers recover?**

After reducing or ceasing exposure to HTV vascular symptoms reduce in some, but not all, people over a number of years. There is evidence that smoking impedes recovery.

#### **What is the best way of managing someone with HAVS?**

Removal from or reduction of further HTV exposure is the key and medical treatment is largely unproven. Stopping smoking and reducing exposure to cold, damp conditions may help prevent symptoms worsening and aid recovery. The Stockholm scale is commonly used to guide management action on employment. Evidence relating the scale to levels of disability, including the ability to carry out daily activities, is currently lacking.

#### **When should exposure cease?**

There is general consensus that workers that have reached Stage 3 on the Stockholm scale (vascular or sensorineural) should normally be removed from further exposure to HTV. Ideally workers with Stage 2 disease should only continue activities resulting in exposure if alternative duties are unavailable and levels of exposure are reduced. In these individuals frequent health surveillance is recommended to try to prevent progression to Stage 3. Stage 2 is a wide category and may in future be subdivided into "early" and "late" phases to assist in decision-making.