Hand-arm vibration syndrome

- Causes
- Classification – staging and scoring
- Tests to support diagnosis
- Control of Vibration at Work Regulations 2005
- Compensation

Vibratory Tools and Processes

- Percussive metal-working tools
- Grinders and other rotary tools
- Percussive hammers and drills used in mining, demolition and road construction
- Forest and garden machinery
- Other processes and tools.

Many tools powered by:
- compressed air
- electricity
- hydraulic power
- internal combustion engines.

Hand-arm Vibration Syndrome

Vascular disorders
Neurological disorders
Muscle disorders
Articular disorders
Other disorders

Stockholm Workshop vascular scale

<table>
<thead>
<tr>
<th>Stage</th>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-</td>
<td>No attacks.</td>
</tr>
<tr>
<td>1</td>
<td>Mild</td>
<td>Occasional attacks affecting only the tips of one or more fingers.</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
<td>Occasional attacks affecting distal &amp; middle (rarely also proximal) phalanges of one or more fingers.</td>
</tr>
<tr>
<td>3</td>
<td>Severe</td>
<td>Frequent attacks affecting all phalanges of most fingers.</td>
</tr>
<tr>
<td>4</td>
<td>Very severe</td>
<td>As is stage 3, with trophic skin changes in the finger tips.</td>
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</tbody>
</table>

Blanching scores

01300 <right> 01366 <left>

Numbness and tingling scores

01300 <right> 01366 <left>

Neurological effects of hand-transmitted vibration

HSE tiered system of health surveillance

The HSE currently suggest:

- “Health surveillance should be provided for vibration-exposed employees who:
  - are likely to be regularly exposed above the exposure action value;
  - are likely to be exposed occasionally above the action value and where the risk assessment identifies that the frequency and severity of exposure may pose a risk to health; or
  - have a diagnosis of HAVS (even when exposed below the action value).”

Tests for vibration-induced white finger: peripheral vascular response to cold

The two most common tests of vascular function:

1. Measurement of finger skin temperature following cold provocation (finger rewarming test)
Measurement of finger skin temperature following cold provocation
ISO 14835-1: 2005

Tests for sensorineural dysfunction:
tactile perception
The two most common tests of tactile function:
1. Measurement of vibrotactile perception thresholds
2. Measurement of thermotactile perception thresholds

Tests of musculoskeletal function

Normal (i.e. Gaussian) distribution

Control of Vibration at Work Regulations 2005

Exposure limit value
“workers shall not be exposed above the exposure limit value”

Exposure action value | Exposure limit value
---|---
Hand-transmitted vibration | 2.5 ms⁻² r.m.s. | 5.0 ms⁻² r.m.s.
Whole-body vibration | 0.5 ms⁻² r.m.s. or 9.1 ms⁻² r.m.s. (VDV) | 1.15 ms⁻² r.m.s. or 21 ms⁻² r.m.s. (VDV)

Summary report of symptoms and signs

Finger blanching probability: ISO 5349-1 (2001)

Exposure (years) | A(8) (ms⁻² r.m.s.) | Exposure, D(8), for 10% finger blanching
---|---|---
1 | 2 | 3
2.5 | 5.0 | 10

Prescription for vibration-induced white finger - since 1st April 1985 -
Episodic blanching, occurring throughout the year, affecting the middle or proximal phalanges (or in the case of the thumb the proximal phalanx) of any three fingers.

Occupations:
- the use of hand-held chain saws in forestry;
or
- the use of hand-held rotary tools in grinding, or in sanding or polishing of metal, or the holding of metal being ground, or metal being sanded or polished by rotary tools;
or
- the use of hand-held percussive metal-working tools, or the holding of metal being worked upon by percussive tools, in riveting, caulking, chipping, hammering, fettling or swaging;
or
- the use of hand-held powered percussive hammers in mining, quarrying, demolition, or on roads or footpaths, including road construction;
or
- the holding of material being worked upon by pounding machines in shoe manufacture.

Prescription for the hand-arm vibration syndrome - updated -
In 2004, the Industrial Injury Advisory Council recommended that prescription should be extended to include the sensorineural component:
1. persistent numbness or persistent tingling, or both, together with
2. significant and measurable reduction in both sensory perception and manual dexterity

Prescription for carpal tunnel syndrome - since 19th April 1993 -

Carpal tunnel syndrome is a prescribed disease - only for the use of hand-held vibrating tools.

It is unclear whether the disorder is a consequence of the vibration or the posture and grip required to use such tools.

Other factors associated with carpal tunnel syndrome are: various hormonal non-occupational factors including female sex, pregnancy, oral contraceptive use, bilateral oophorectomy, diabetes mellitus and rheumatoid arthritis.

Prescription for carpal tunnel syndrome - Recommendation of the IIAC - July 2006

Carpal tunnel syndrome is recommended by the Industrial Injuries Advisory Council for prescription for two types of job:
(a) The use, at the time the symptoms first develop, of hand-held powered tools whose internal parts vibrate so as to transmit that vibration to the hand, but excluding those which are solely powered by hand; or
(b) Repeated palmar flexion and dorsiflexion of the wrist for at least 20 hours per week in those who have undertaken such work for at least 12 months in aggregate in the 24 months prior to the onset of symptoms.

New cases of Prescribed Vibration-induced White (VWF) and Carpal Tunnel Syndrome (CTS) in Great Britain 2003 - 2012

Vibration-induced white finger (VWF) is the most commonly prescribed disease under the Industrial Injuries Disability Benefit scheme for the last 10 years. However, the number of new cases of VWF has fallen over that period.