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# Use of photography in the diagnosis and staging of **HAND ARM VIBRATION SYNDROME (HAVS)**



## INTRODUCTION

The vascular component of hand-arm vibration syndrome (HAVS) is manifest as Raynaud's phenomenon (RP). In the absence of any reliable objective diagnostic test for vascular HAVS, diagnosis is based primarily on the history obtained from the employee. A history of RP has been described as the gold standard for diagnosis of vascular HAVS<sup>1</sup>; in the UK, the Health and Safety Executive (HSE) have emphasised the need for a sufficiently detailed history of the attacks of blanching to differentiate RP from a normal physiological response to cold.<sup>2</sup>

In 2014 an international Delphi exercise concluded that at least biphasic colour changes are required to make the diagnosis of RP – with white/pallor and blue/cyanosis being the two most important colours to make a diagnosis – with triphasic changes increasing the likelihood of RP.<sup>3</sup> Photographs of episodes provided by patients were “thought to be helpful but not required to make a diagnosis of RP”.

A review of 36 cases of photographs taken in possible HAVS cases found that, on careful history taking, 11% had symptoms that were not consistent with RP, and 40% were unable to provide photographic evidence of RP.<sup>4</sup> The study group comprised individuals making a claim for HAVS, so it is unclear whether those results can be extrapolated to those undergoing routine health surveillance. Nevertheless, a photograph of the employee's hands/digits during an attack of colour change is potentially strongly supportive that true vasospasm is being described.

Another Delphi study recommended that a blanching score taken from photographs of the hands during vasospastic episodes be used to stage vascular HAVS in place of self-recall and frequency of attacks.<sup>5</sup> However, it is possible that such photography may not capture all affected fingers during a single attack, so reliance on this for staging may not be universally appropriate. It also raises the important question of whether or not a definitive diagnosis and/or grading can be offered in the absence of such photographs.

Shortly after that, a review of the assessment and objective testing in the vascular component of HAVS by the Industrial Injuries Advisory Council recommended the use of photography and concluded that “*photographs will be suitable only to supplement the patient's description of their symptoms and relationship with work and exposures, but will not be sufficient on their own to replace this evidence*”<sup>6</sup>.

Diagnostic criteria for HAVS were defined in the Court of Appeal judgement in *Montracon Ltd v Whalley*<sup>7</sup> as being:

- a history of exposure to vibration sufficient to cause a risk of development of the condition
- a clinical history of symptoms which is consistent with one or more of the components of HAVS
- the absence of any alternative explanation for the symptoms.

As it was not relevant to this case, the Court of Appeal did not consider the use of photography, but taken at face value, the second criterion requires only a “clinical history of symptoms which is consistent with one or more component of HAVS”, inferring that photography or observation of an episode of Raynaud's phenomenon is not essential to meet these legally defined diagnostic criteria. Nevertheless requests for photographs are now common in the course of civil litigation.

## DIAGNOSIS OF THE VASCULAR COMPONENT OF HAVS

Whether for legal purposes or for routine health surveillance, the diagnosis of vascular HAVS based on the clinical assessment alone (i.e. without photographs or witnessed episodes of Raynaud's phenomenon) can be made to different levels of confidence:

1. *Beyond reasonable doubt*
2. *Probable, i.e. "on balance of probability"*
3. *Possible*
4. *Not suggestive of HAVS.*

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### 1. Diagnosis made clinically beyond reasonable doubt

In cases with a clear history which includes the characteristic features of Raynaud's phenomenon, with an appropriate temporal relationship with lifetime (cumulative) vibration exposure, a distribution according with likely differential vibration exposure of the digits and no evidence of a plausible alternative cause of the symptoms, clinical diagnosis may be made beyond reasonable doubt. In spite of this, where the clinical presentation is sufficient in itself to make a diagnosis, photographs are likely to be useful confirmatory evidence and provide a record for future comparison.

In these cases, even in the absence of a photograph, diagnosis and grading can be offered, along with advice regarding further exposure to vibration, and that diagnostic criteria be met for the purposes of RIDDOR.

### 2. Diagnosis of vascular HAVS probable, i.e. "on balance of probability"

It is possible that the description of colour changes is not typical, or is insufficient to allow confident diagnosis, and photographs of the colour changes experienced by the employee would likely provide clarity. Nevertheless if, on balance of probability, the diagnosis based on the clinical description is of HAVS, the diagnosis should be confirmed on that basis.

If photographs are then provided which show that colour changes are not consistent with RP, the diagnosis and grading should be reviewed by a senior occupational health physician with experience in HAVS. Particular care should be taken to ensure that photographs are taken during the blanching phase of an attack, and do not show, for example, blotchiness associated with reperfusion. Where photographs provide good evidence of RP, and other factors are compatible with the diagnosis, HAVS should be confirmed.

Workplace advice, and advice regarding continuation of vibration exposure should be offered on the basis of the clinical diagnosis, pending receipt of photographs. The diagnosis means that the HAVS criteria for RIDDOR are met.

## DIAGNOSIS OF THE VASCULAR COMPONENT OF HAVS

### 3. Possible diagnosis of HAVS

In these cases, the clinical history, including description of colour changes is such that a diagnosis is not appropriate. Full assessment is likely to include photographs of the colour changes experienced by the employee, but may also require consideration of alternative diagnoses and appropriate investigation, e.g. for carpal tunnel syndrome or connective tissue disease.

A diagnosis of HAVS is not appropriate:

- a. where the clinical history does not lead to a diagnosis of RP and there is no photographic evidence or
- b. where the history does not suggest RP and (subject to the above caveat re timing of the photograph) the photographs do not show characteristic colour changes.

The absence of confirmed diagnosis means that the HAVS criteria for RIDDOR are not met. However, the nature of the symptoms reported may be such that advice is required regarding further vibration exposure. That will be a matter of clinical judgement. Where the history and photographs are more suggestive of primary Raynaud's, or other secondary Raynaud's, workplace management may be similar to that for HAVS. This will be a matter for senior clinical judgement.

Where there is no description of characteristic colour changes but photographs show typical blanching of RP, clinical review should be undertaken without delay by a senior occupational physician with experience in HAVS.

### 4. Description of colour changes not suggestive of HAVS

In these cases, alternative diagnoses should be considered. Photographs of colour changes may be helpful and could potentially influence the judgement as to whether or not the diagnosis should be reviewed on that basis. As in the previous category, where there is no description of characteristic colour changes, but photographs show typical blanching of RP, clinical review should be undertaken by a senior occupational physician with experience in HAVS.

#### RECOMMENDATIONS

Photographs, usually from a phone, should be requested ahead of the face-to-face appointment whenever possible.<sup>8</sup> These should be identifiable as the individual's (compare with hands in situ or taken against the face) although it has been noted that since an individual's hands are unique it may be possible to make confident identification that the hands in the photograph are those of the employee concerned.

Copies of the photographs should be retained in the employee's occupational health record, and should be accompanied by a record of the date and circumstances the photographs were taken, and the clinician's interpretation, i.e. which digits/phalanges show colour change, the nature of the colour change and the demarcation. Notes should also record that the photographs were considered in the diagnosis and staging, and the influence of the photographs on the conclusions drawn and advice offered.

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