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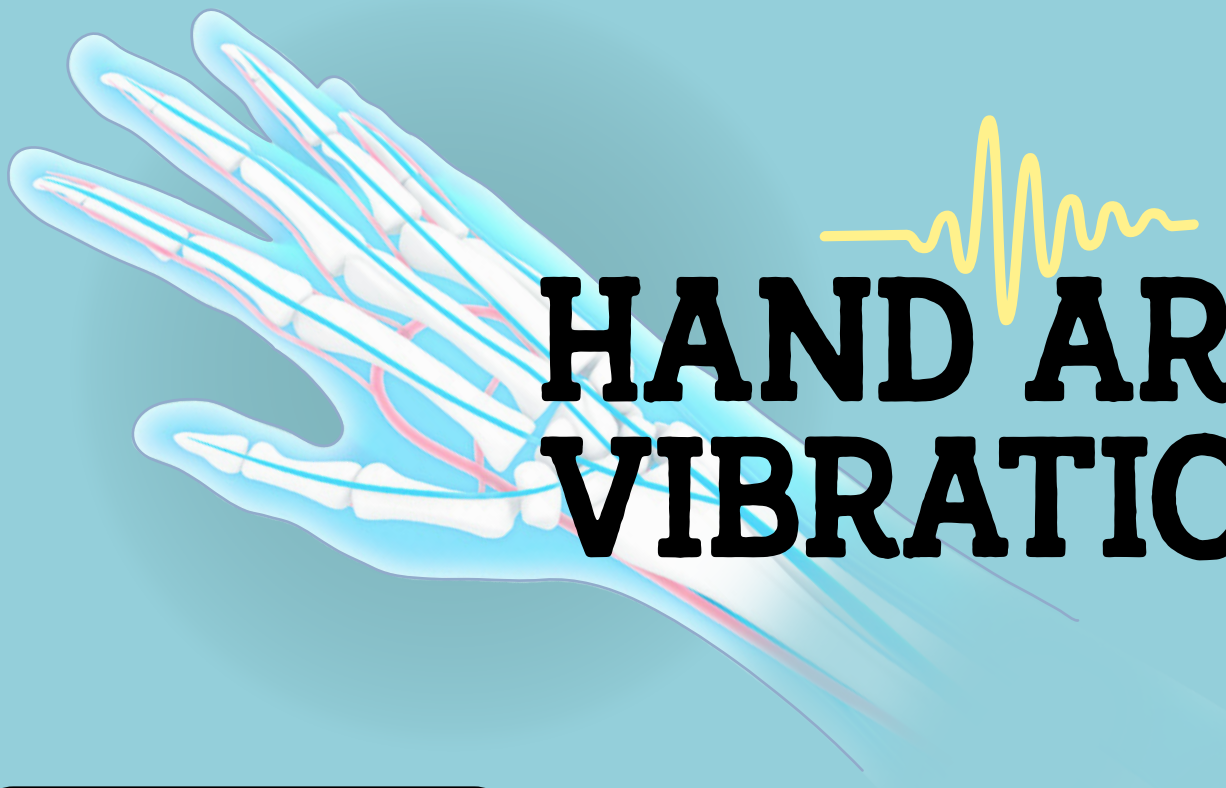
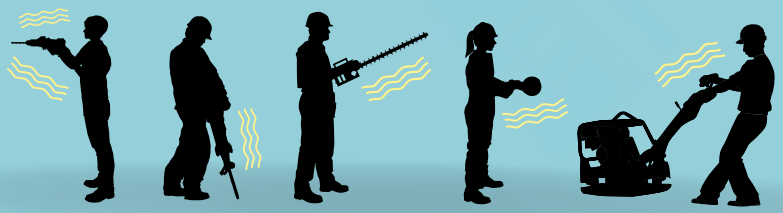


HAND ARM VIBRATION

International conference

6-9 JUNE 2023

Espace Prouvé,
Nancy, France



hand-arm-vibration2023.inrs.fr

Welcome

On behalf of INRS, it is my privilege to invite you to the 15th International Conference on Hand-Arm Vibration which is being organised under the aegis of the International Advisory Committee on Hand-Arm Vibration.

Workers are exposed to hand-arm vibration in many work sectors, such as building and construction, engineering, metalworking and even maintenance of green spaces. Hand-arm vibration health risks come from the daily use of vibrating hand-held or hand-guided machines such as grinders, chipping hammers, vibratory tampers and vibrating plate compactors. Regular exposure to vibration from such machines can result in neurological damage (numbness and tingling in the fingers and hands), vascular disorders (vibration white finger), or musculoskeletal disorders in the hand and arm.

This multidisciplinary conference will bring together experts from many different backgrounds to present and discuss their work on hand-arm vibration. The conference will help to develop a better understanding of the health risks from vibration exposure, leading to improved risk control measures. This event is intended for scientists, occupational physicians, epidemiologists, machine manufacturers, metrologists, health and safety practitioners, standardisation groups and government agencies.

Take part in the hand-arm vibration research community and join us in Nancy.

Séverine BRUNET
Director of Prevention Affairs

Programme Overview

Tuesday 6 June

08:30 Welcome / Arrival of delegates / Registration

09:30 Welcome messages: Chairman of the Advisory Committee, Officer of the INRS joint Board of Directors

09:45 **Physiological response**

Chairpersons: Alice Turcot, Anthony Brammer

Physiological effects of single shocks on the hand-arm system – a randomized experiment
E Ochsmann – A Corominas, U Kaulbars, H Lindell and B Ernst

Acute vibrotactile threshold shifts in relation to force and hand-arm vibration
S Gao – Y Ying

Cold response of digital vessels and metrics of daily vibration exposure
M Bovenzi – **M Tarabini**

Effects of applied pressure on sensorineural and peripheral vascular function in an animal model of hand-arm vibration syndrome
K Krajnak – C Warren, X Xu, S Waugh, P Chapman, D Welcome and R Dong

11:05 Break

11:35 **Mechanobiological response**

Chairpersons: Kristine Krajnak, Massimo Cavacece

Development of a novel rat-tail model for studying finger vibration health effects
R Dong – C Warren, J Wu, X Xu, **D Welcome,** S Waugh and K Krajnak

Biomarkers in patients with hand-arm vibration injury entailing Raynaud's phenomenon and cold sensitivity, compared to referents
E Tekavec – T Nilsson, L Dahlin, A Axmon, C Nordander, J Riddar and M Kåredal

Arterial stenosis stemming from vibration-altered wall shear stress: a way to prevent vibration-induced vascular risk?
C Noël – M Reda, N Settembre and E Jacquet

12:35 Lunch (seated)

14:00 **Epidemiology**

Chairpersons: Ying Ye, Elke Ochsmann

Investigation of hand-arm vibration (HAV) of railroad track workers – Addressing Stakeholder Conflict of Interest
E Johanning – P Landsbergis

Raynaud's phenomenon and hand-arm vibration exposure in the general population of northern Sweden
A Stjernbrandt – H Pettersson, R Lundström, I Liljelind, T Nilsson and J Wahlström

Onset of vibration-induced white finger: Insight derived from a meta-analysis of exposed workers
M Scholz – A Brammer and S Marburg

Dose-response relationship between hand-arm vibration exposure and musculoskeletal disorders of upper extremities: A case-control study among German workers
Y Sun – F Bochmann, W Eckert, B Ernst, U Kaulbars, Nigmann, N Raffler, C Samel and C Van Den Berg

15:20 Break

15:50 **Epidemiology**

Chairpersons: Albin Stjernbrandt, Lars Gerhardsson

Hand-arm vibration syndrome in dentistry: a questionnaire survey among dentists and review of literature
A Turcot – D Hamel and M Tessier

Hand-arm vibration exposure trends among the work force in Sweden
H Pettersson – M Sjöström, M Wikström and J Selander

A Delphi study to address a number of issues relating to the practical management of hand-arm vibration syndrome and carpal tunnel syndrome in the workplace
R Cooke – D Ashdown, H Fox, C Grobler, R Hall-Smith, D Haseldine, E Kotze and I Lawson

Wednesday 7 June

08:00 Welcome

09:00 **Vibration reduction**

Chairpersons: Nastaran Raffler, Paul Pitts

Evaluation and damping of high frequency vibrations on a tightening tool
O Lundin – R Haettel

Vibration reduction on pneumatic rock drill for the rock face stabilisation sector
H Lindell – T Clemm and SL Grétarsson

Evaluation and damping of high-frequency vibrations on a percussive tool
R Haettel – Oscar Lundin

Comparison of anti-vibration glove performances in the laboratory and in the field. Similarities and differences
A Tirabasso – **R Giovanni,** P Nataletti and E Marchetti

10:20 Break

11:00 **Modelling**

Chairpersons: Christophe Noël, Hans Lindell

Fingertip model for analysis of high frequency vibrations
P Ottosson – H Lindell and SL Grétarsson

Factoring muscle activation and anisotropy in modelling hand-transmitted vibrations: a preliminary study
S Vauthier – C Noël, H Ngo, J Gennisson, J Chambert, E Foltête and E Jacquet

Vibration emission of grinders: experiments and model
Q Pierron

12:00 Lunch (seated)

13:30 **Biomechanical response**

Chairpersons: Pierre Marcotte, Emmanuelle Jacquet

Interference of vibration exposures on the force production in the hand-arm system
M Cavacece – A Tirabasso, R Di Giovanni, S Monti, E Marchetti and L Fattorini

Using an impact wrench in different postures – an analysis of awkward hand-arm posture and vibration
N Raffler – T Wilzopolski and C Freitag

Methods for the laboratory evaluation of HAV-related comfort of bikes
S Marelli – M Tarabini

Comparison between the biomechanical response of the hand and foot when exposed to vertical vibration
F Marrone – C Massotti, K Goggins, T Eger, E Marchetti, M Bovenzi and M Tarabini

Nonlinearity of power absorption curve and hand-arm system physiology
E Marchetti – L Fattorini, M Tarabini, R Di Giovanni, M Cavacece and A Tirabasso

Using an impact wrench in different working directions – an analysis of the individual forces
T Wilzopolski – N Raffler and C Freitag

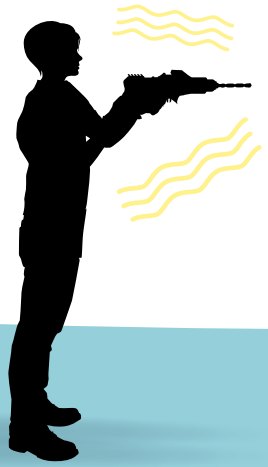
15:25 Taylor Award

16:00 Rdv for guided city tour (in front of the statue of the red bull)

16:15 Guided tour of the old city

17:45 End of the guided city tour

19:00 Conference dinner at the Nancy City Hall



Thursday 8 June

08:00 Welcome

09:00 **Health effects**

Chairpersons: Ronnie Lundström, Kazuhisa Miyashita

Dupuytren's disease in relation to exposure to hand-transmitted vibration. A systematic review and meta-analysis
T Nilsson – J Wahlström, E Reierth and L Burström

Radiographic hand osteoarthritis in relation to exposure to hand-transmitted vibration. A systematic review and meta-analysis
T Nilsson – J Wahlström, E Reierth and L Burström

The hand-arm vibration syndrome in workers exposed to transient and high frequency vibrations
L Gerhardsson – C Ahlstrand, P Ersson and E Gustafsson

Neurological impairment from hand–arm vibration exposure
O Lundberg – IL Bryngelsson and **P Vihlborg**

Hand-arm vibration association with myocardial infarction
H Pettersson – C Lissåker and J Selander

10:40 Break

11:10 **Measurement**

Chairpersons: Setsuo Maeda, Nastaran Raffler

High-frequency vibration from hand-held impact wrenches and propagation into finger tissue
SL Grétarsson – H Lindell

Determination of the number of measurements required for 95% confidence in an upper quartile value of hand-arm vibration measurement using the Monte-Carlo method
P Pitts

Evaluation of vibration emission values of nailers: can an automatic test stand be used instead of human operators?
M Vincent – T Padois, Ma Gaudreau, T Dupont and P Marcotte

12:10 Lunch (seated)

13:25 **Exposure evaluation and control**

Chairpersons: Romain Haettel, Pierre Marcotte

Definition and Quantification of Shock/ Peak/Transient Vibration
H Lindell – P Johannisson and SL Grétarsson

Daily exposure estimation from field measurements of repetitive shock vibration
F Maitre – M Amari

Vibration characteristics of ultrasonic activated straightening and forming machines
D Aoustin

14:25 Break

14:50 **Exposure evaluation and control**

Chairpersons: Judith Galuba, Paul Pitts

Necessity and considerations for on-body vibration measurement equipment
S Maeda – Y Ye and S Gao

French occupational disease system. Example of diseases caused by hand-arm vibration
A Delepine

Daily exposure to hand-arm vibration of technicians in wastewater treatment plants and after-sales service
R Petitfour – G Ducrot and I Jannin Devilleneuve

Zero vibration injuries - a Swedish holistic approach to reduce vibration injury
C Pettersson – H Lindell and SL Grétarsson

16:15 Closing words and invitation to the next congress

Friday 9 June

Nancy workshop on hand-transmitted mechanical shock and high-frequency vibration

Hand-transmitted mechanical shock (HTS) is generated by many common machines such as staplers, nail-guns, impact wrenches, and road breakers. These shock signals contain vibration at frequencies higher than those currently included in international standards on vibration measurement. There is limited knowledge on whether or how shock and high-frequency vibration contribute to the risk to health from vibration exposure.

In this workshop we would like to introduce the issue of HTS and the work currently pursued within international standards groups on shocks and high-frequency vibrations (ultravibrations). We will explore questions such as:

- Do we accept that the health effects due to exposure to shocks are the same as those from continuous vibration?
- Is ISO 5349-1 and the A(8) metric suitable for predicting the risks of health effects from HTS?
- Do we need a new metric specifically for HTS?
- What should be the upper frequency limit for measurement?

The workshop's aim is to assess whether there is a consensus view amongst experts on the metric most suited to the evaluation of HTS.

A summary of the workshop will be published. The workshop outcomes will feed directly into the work being carried out by the international standards' working group on hand-arm vibration.

09:00	Introduction **P Pitts**
09:10	Health effects of high-frequency vibration and shock – a historical overview **R Lundström**
09:25	Physics of shock and physiological effects on biological systems **H Lindell**
09:40	Relating occupational exposures to health effects **T Brammer and M Scholz**
10:10	Breakout sessions # 1 & Coffee Questions: Human effects
11:00	Feedback
11:15	ISO/TC 108/SC 4/WG 3 activities **H Lindell and P Pitts**
11:45	Breakout sessions # 2 Questions: Measurement
12:15	Feedback
12:30	Lunch – Buffet
13:30	Present draft resolutions to the workshop to cover areas of agreement **P Pitts, H Lindell, T Brammer and R Lundström**

Contact

Information on the programme:

Bertrand Tinoco
+33 (0)3 83 50 20 28
Christophe Noël
+33 (0)3 83 50 21 12
ichav2023@inrs.fr

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