

BAD VIBRATIONS

Controlling Hand & Arm Vibration Syndrome (HAVS)



CONTENTS

- » HAVS Defined
- » Scope of Problem
- » ANSI Standard, Compliance, Impact
- » Ergodyne Solution Offering



DEFINITION OF HAVS

- » Disease entity with the following components:
 - » Circulatory Disturbances
 - » Blanching of fingers
 - » Vasospasm
 - » Sensory and Motor Disturbances
 - » Numbness
 - » Loss of coordination and dexterity
 - » Musculoskeletal Disturbances
 - » Muscle, bone, nerve and joint disorders



EXTERNAL ACCELERANTS

- » Cold
- » Moisture // Dampness
- » Nicotine



WHO IS AT RISK?

- » 8% of U.S. workers report exposure to vibrating tools more than 4 hours per day
- » 50% of the 1.5 million exposed workers will develop symptoms related to HAVS
- » Latency period of vascular symptoms can be 6 years or more

NIOSH 1989 & Journal of Occupational and Environmental
Medicine Sept.1998



WHO IS AT RISK?

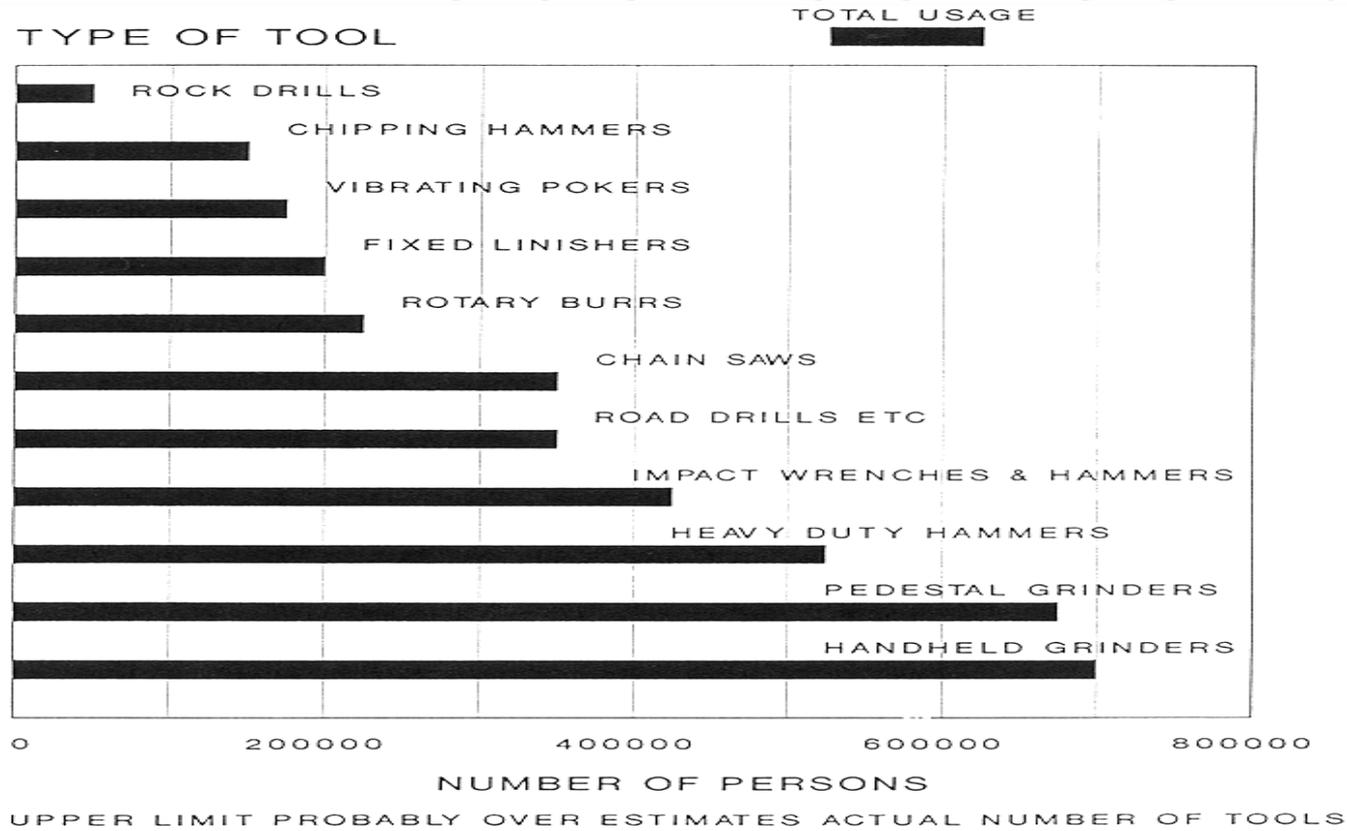
Workers Potentially Exposed to Hand-Arm Vibration

Number of Workers	Industry	Type of Tool
500,000	Construction	Hand tools
200,000	Farming	Gasoline chain saws
14,000	Metal working	Hand tools
54,000	Steel	Furnace cleaning using powered hand tools
30,000	Lumber and wood	Gasoline chain saws
34,000	Furniture manufacturing	Hand tools
100,000	Mining	Pneumatic drills
250,000	Truck and auto manufacturing	Hand tools
64,000	Foundries	Hand tools

Total 1,246,000

Ref: "Vibration Syndrome." Current Intelligence Bulletin 38. 1983 DHHS (NIOSH) Publication No. 83-110.

HAZARDOUS TOOL USAGE



VIBRATION vs. IMPACT

» Vibration

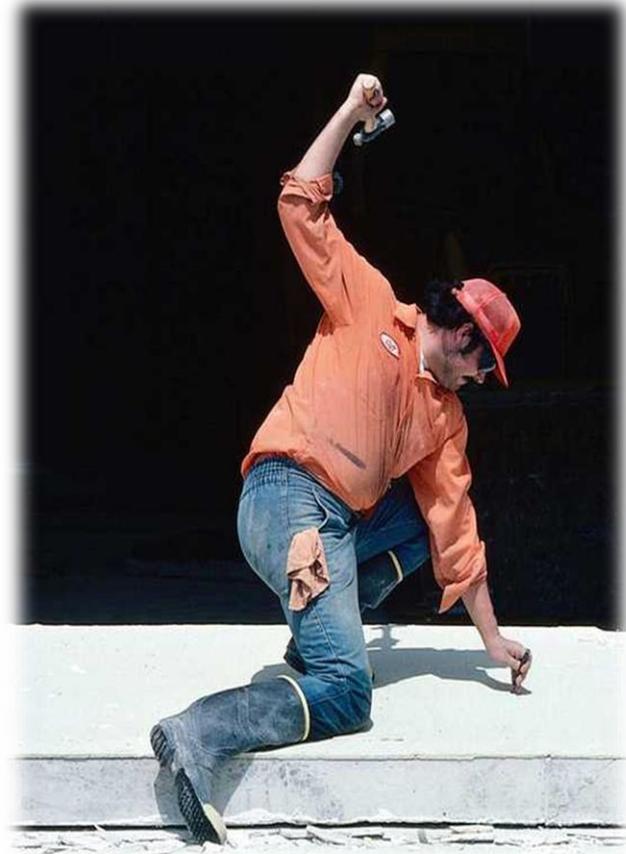
- » Externally Generated
- » Harmonic Motion
 - » Frequency
 - » Acceleration
 - » Velocity
 - » Displacement



VIBRATION vs. IMPACT

» Impact

- » Internally generated
- » Person is the power supply
- » Contact stress
 - » Tool
 - » Body part acting as hammer



ANATOMY OF HAVS



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ANATOMY OF HAVS



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ANATOMY OF HAVS



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ANSI STANDARD

ANSI S2.73-2002 (R2007) // ISO 10819:1996
Compliance and Impact



ANSI ADOPTS ISO 10819

- » ANSI S2.73-2002 (R2007) // ISO 10819:1996
 - » ISO 10819 (Mechanical Vibration and Shock - Hand/Arm Vibration – Method for Measuring and Evaluation of the Vibration Transmissibility of Gloves at the Palm of the Hand)
- » This is a *glove standard*
 - » It is NOT a polymer standard
 - » It is NOT a tool testing standard



ANSI S2.73 // ISO 10819

- » Establishes criteria for Anti-Vibration gloves
 - » Gloves must be full-fingered
 - » Polymer must be of uniform thickness
 - » Mid-range frequencies cannot be augmented/amplified
 - » High-range frequencies must be reduced 40%



ADDITIONAL REGULATORY ACTIVITY

- » State of Washington has integrated ISO vibration standard into their ergonomics standard
- » Potential to be “baked into” other pending state ergonomics regulations
- » All pending ergo standards/guidelines recognize vibration as an ergonomic risk factor



ANSI STANDARD: IMPACT

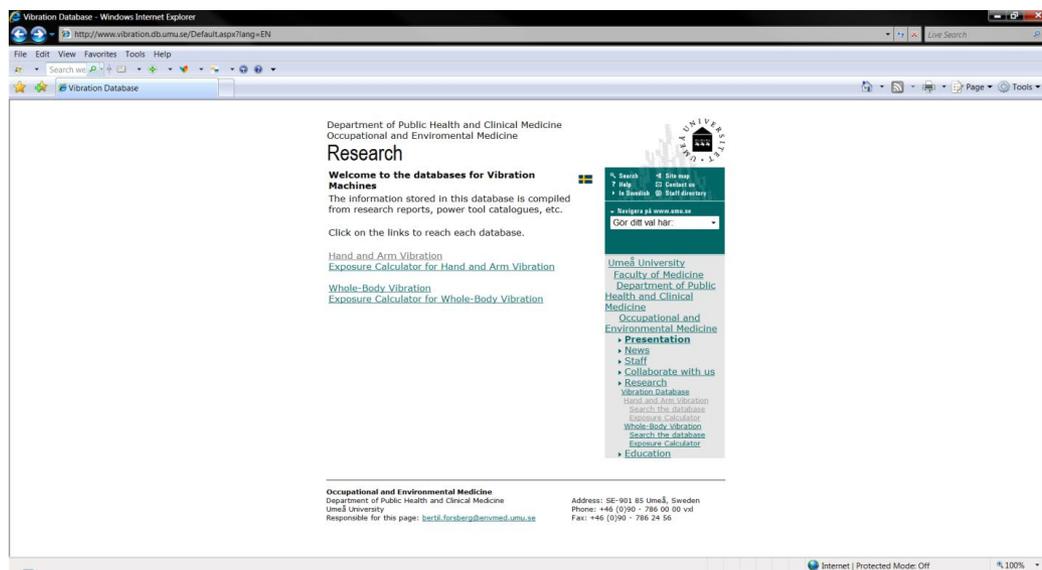
- » Impact on Employers
 - » Best practices guidance
 - » Legal liability concerns
- » Government Entities



TOOL VIBRATION FREQUENCY DATA

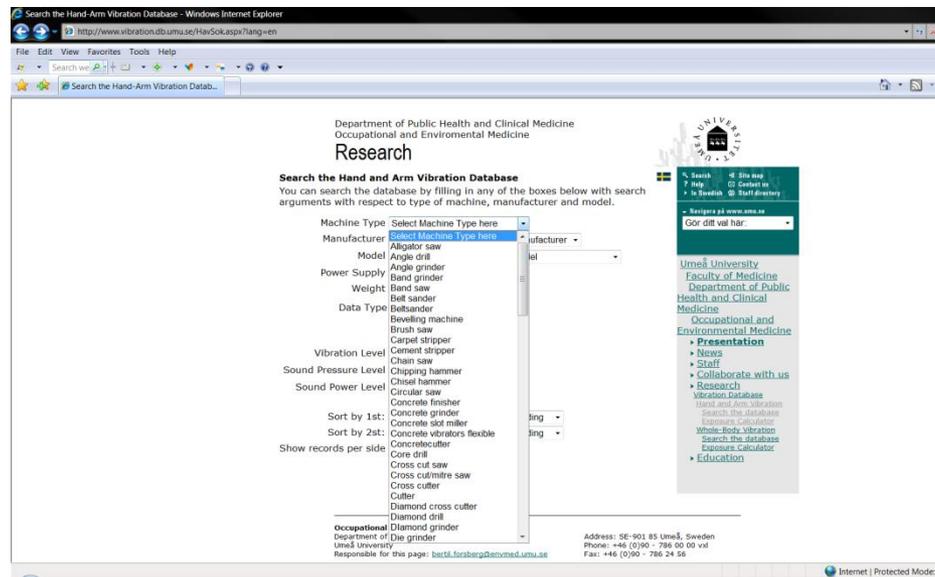
<http://www.vibration.db.umu.se/Default.aspx?lang=EN>

“Dept. of Public Health & Clinical Medicine”, Umeå University Sweden



TOOL VIBRATION FREQUENCY DATA

1. Click on “Hand and Arm Vibration” link and enter tool data



TOOL VIBRATION FREQUENCY DATA

2. Select tool and obtain vibration level in m/s^2

Department of Public Health and Clinical Medicine
Occupational and Environmental Medicine

Research

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Machine Data for Hammer drill: Hitachi DV 20V2

Machine type	Hammer drill
Manufacturer	Hitachi
Model	DV 20V2
Power supply	Electric
Power	710 Watt
Weight	2.30 kg
RPM	0-1100/0-2600 rpm



Declared CE Values

Vibration Level	13.6	m/s^2	Measure Standard
Sound Pressure Level	0.0	dB(A)	EN 7100-6000
Sound Power Level	114.9	dB(A)	
Date of Measurement	Jan 07, 2001		

Data modified on Dec 13, 2001

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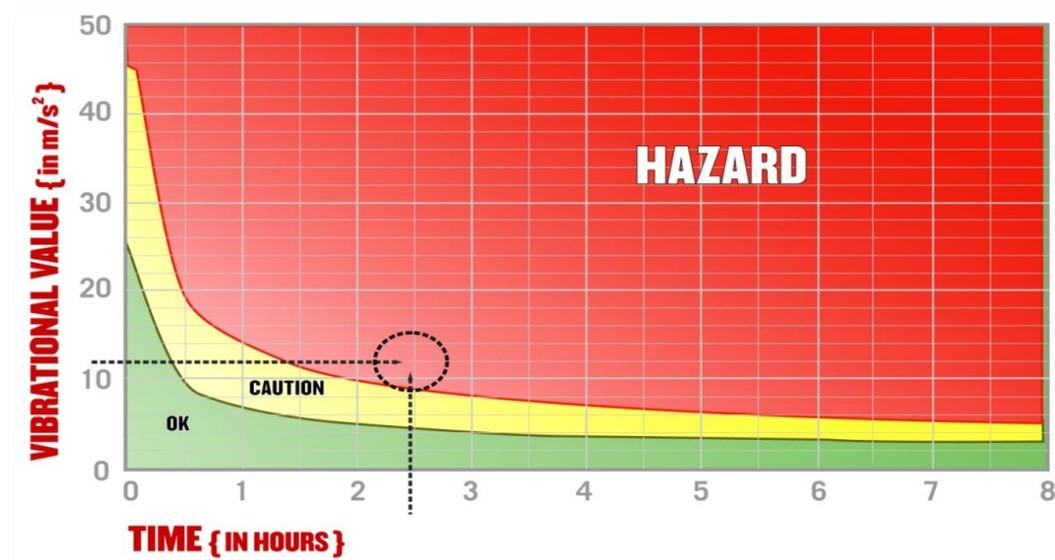
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TOOL VIBRATION FREQUENCY DATA

3. Identify hazard level using the chart at right, based on vibration level and exposure time



ADDITIONAL INFO // RESOURCES

- » Purchase the ANSI standard
 - » <http://webstore.ansi.org>
- » Medical dictionary definition of HAVS
 - » <http://www.medterms.com/script/main/art.asp?articlekey=19713>
- » OH&S on-line HAVS article (April 2009)
 - » <http://ohsonline.com/articles/2009/04/01/havs-still-a-threat.aspx>



HAVS SOLUTIONS



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HIERARCHY OF CONTROLS



ENGINEERING CONTROLS

- » Tool Design
- » Grip
- » Control Dampness and Wetness
- » Control Cold Temperature



ADMINISTRATIVE CONTROLS

- » Job Rotation
- » Job Technique



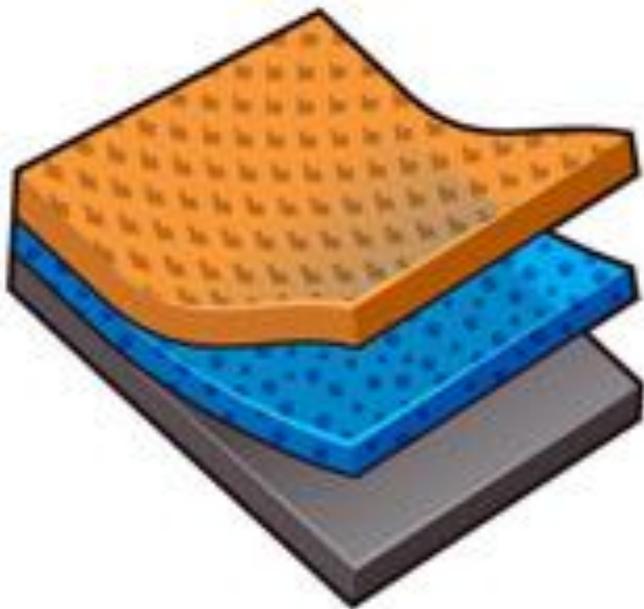
PERSONAL PROTECTIVE EQUIPMENT

» Gloves

- » Half vs. full-fingered
- » Types of polymers
- » Gloves vs. Tool Wraps
- » ANSI // ISO testing standards



Nu²O₂™ // POLYMERS



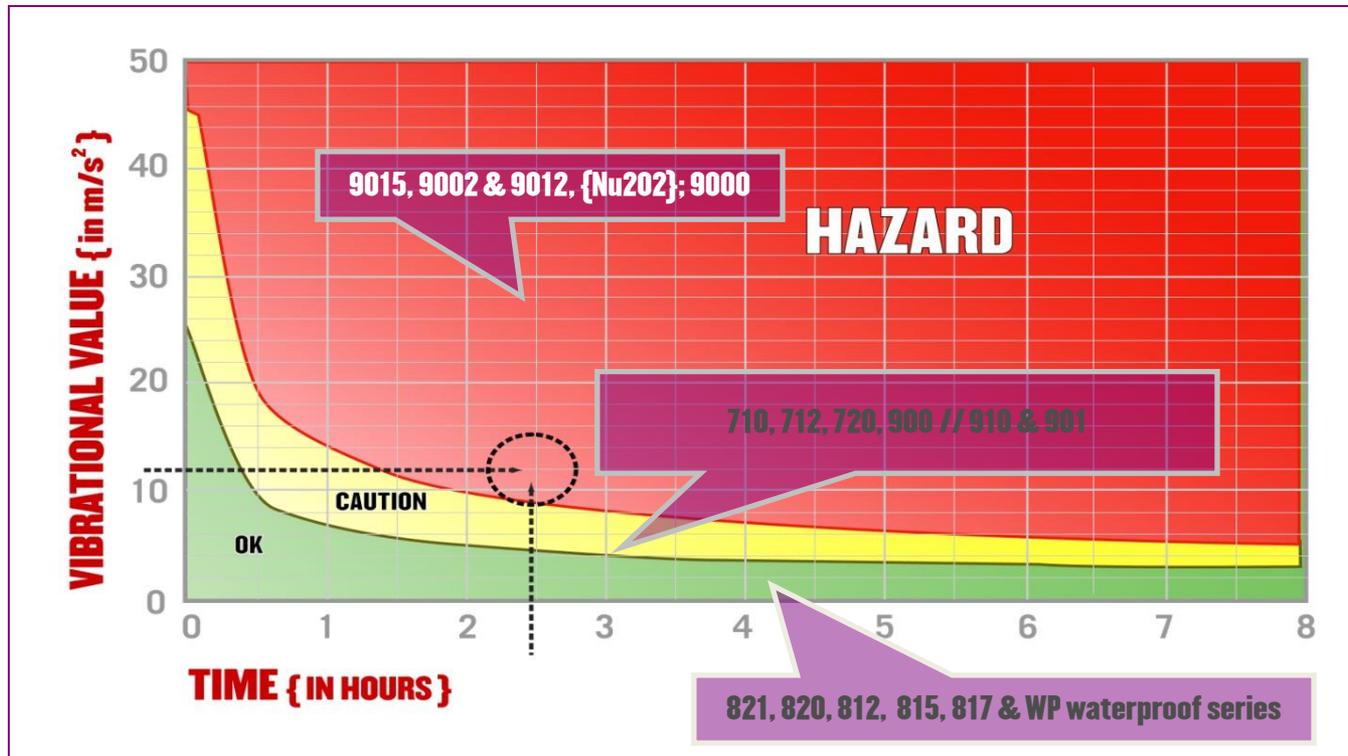
- » Polymers
 - » Nu²O₂™
 - » Akton
- » 3 years of rigorous testing and development
- » Result: ISO certification for patented Nu²O₂™ polymer

ERGODYNE GLOVES

Solutions for Reducing Worker's Risk of
Developing HAVS



EX. EXPOSURE LEVEL



EXAMPLE: If an impact wrench with a vibration value of 12 m/s² is used for 2.5 hours a day, the exposure level is in the hazardous area. The vibration must be controlled.

ERGODYNE GLOVE SOLUTIONS

» **Hazard Level**

» **Caution Level**

» **OK Level**

» **Certified Vibration Control:**

- » 9015, 9002, 9012 (Nu²O₂™)
- » 9000 (chloroprene rubber)
- » Passes mid-range, high range 40%+ reduction

» **Non-Certified Vibration // Impact Control:**

- » 900 // 910, 901, 710, 712, 720
- » Meets mid-range, limited to 10% reduction in high range

» **Handler, Hi-Vis, Temp and Fire & Rescue:**

- » All models are designed for non-vibration applications



PROFLEX® 9015F(x)

CERTIFIED VIBRATION REDUCTION GLOVE

Certified AV Glove w/ Dorsal Protection offers max impact/vibe protection, plus tough dorsal guard

- » ANSI S2.73 // ISO 10819:1996 // EN388 & 420 Certified
- » Patented Nu²O₂® polymer pad
- » Pigskin leather palm and fingers
- » Molded TPR for extra protection on back
- » Low-profile closure with woven elastic cuff
- » Anti-odor treatment
- » Pull-on tab



PROFLEX® 9002 // 9012

CERTIFIED VIBRATION REDUCTION GLOVE

Incorporates patented Nu²O₂® polymer plus durable pigskin construction. 9012 features built-in wrist support

- » ANSI S2.73 // ISO 10819:1996 // EN388 & 420 Certified
- » Patented Nu²O₂® polymer pad
- » Pigskin leather palm and fingers
- » Low-profile closure with woven elastic cuff
- » Anti-odor treatment
- » Pull-on tab



PROFLEX® 9000

CERTIFIED LIGHTWEIGHT ANTI-VIBRATION GLOVE

Certified Anti-Vibration: Unique chloroprene rubber palm pad combined with lightweight, breathable cotton/nylon knit

- » ANSI S2.73 // ISO 10819:1996 // EN388 & 420 Certified
- » Unique chloroprene rubber palm pad
- » Lightweight, breathable 7-gauge cotton/nylon seamless knit construction
- » Pre-curved design provides comfort, dexterity and flexibility



PROFLEX® 900

EXAMPLE OF IMPACT (NON-CERTIFIED) GLOVE

Powerful impact protection and full tactility

- » Visco-elastic gel polymer palm pad to dampen shock and impact
- » Abrasion-resistant pigskin leather & breathable stretch spandex
- » Low-profile closure with woven elastic cuff
- » Anti-odor treatment
- » Half-finger design for optimal function
- » Neoprene knuckle pad



PROFLEX® 710

EXAMPLE OF NON-CERTIFIED GLOVE

Superb dexterity, function, and protection for the professional tradesman

- » Premium EVA foam palm pad dampens shock and impact
- » Textured PVC palm
- » Breathable, 3-layer stretch spandex with neoprene knuckle pad
- » Synthetic leather palm and fingers
- » Flex zones for added comfort
- » Reinforced fingertips for optimal durability
- » Full-finger design



WHY SHOULD EMPLOYERS ACT NOW?

- » Agencies are increasing focus on compliance
- » Addressing the issue now will reduce injury and legal exposure, demonstrate best practices,
- » And it's just the right thing to do for your employees



QUESTIONS?



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THANK YOU!



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THINK. THINK DIFFERENTLY. THINK TENACIOUSLY.

