Joint AIHA-CPWR Webinar: Addressing Four Major Health-Related Hazards in Construction

June 14, 2022

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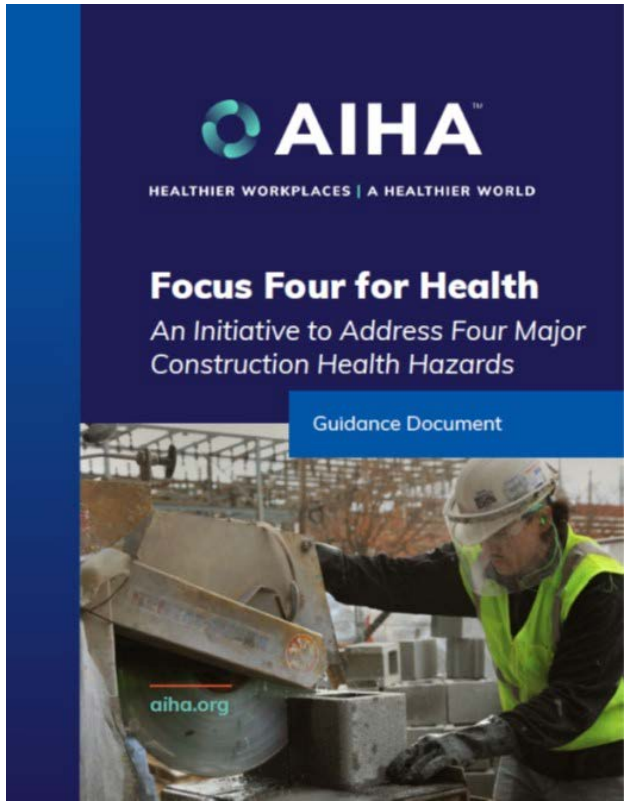
tsimpson@cpwr.com.

Today's event is being recorded and will be emailed & posted on **cpwr.com/webinars**.



Addressing Four Major Health-Related Hazards in Construction

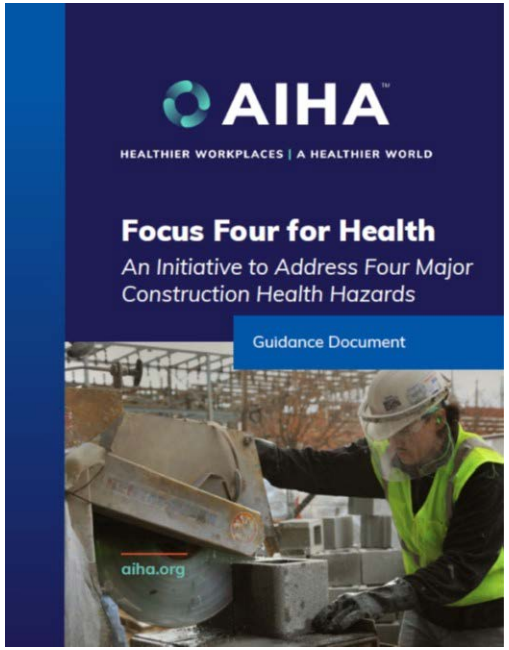
Joint AIHA-CPWR Webinar
June 14, 2022

Barb Epstien, MPH, CIH, FAIHA
Industrial Hygienist
AGC Oregon-Columbia Chapter

Overview

- What is ***Focus Four for Health***?
- Why is it needed?
- Who is the target audience?
- How were the 4 topics selected?
- What information is provided?
- What can you do?

What is it?



- AIHA Construction Committee publication
- Companion piece to existing “Focus Four”
- Tool to raise awareness
- Practical, easy-to-follow format
- http://www.focusfourconstructionhealth.org/

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Who is it for?

- Construction employers & workers
- Trade & labor organizations
- Trainers
- Insurance / loss control
- OSHA/NIOSH advisory groups
- S&H practitioners (esp. in construction)

Existing Focus Four (a.k.a. “Fatal Four”)

OSHA safety outreach program targeting top 4 construction fatality sources (c.1994)

Impact:

- Inspection targeting
- Training (10 & 30 hr)
- Industry partnerships
- Reduced fatality rate

Focus Four:
Successful, familiar template

INJURY FOCUS ONLY

Why do health efforts lag behind?

- Seeing is believing
- Chronic exposure: link less obvious
- Regulatory gaps / low enforcement profile

Flux core welding;
Photo: J. Vinton Schafer & Sons Inc. and CCBC via eLCOSH

Why do health efforts lag behind (cont'd)?

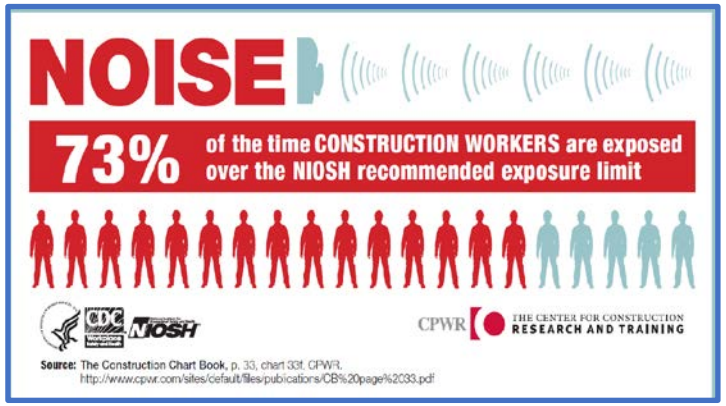
- Under-reported in national stats
- Fewer training resources/materials
- *Inadvertent message: Health is not a priority*

How were the 4 topics selected?

- Best available information
- Professional experience
- Impact criteria:
  - Severity
  - # Workers
  - # Trades
  - Awareness
  - Solutions

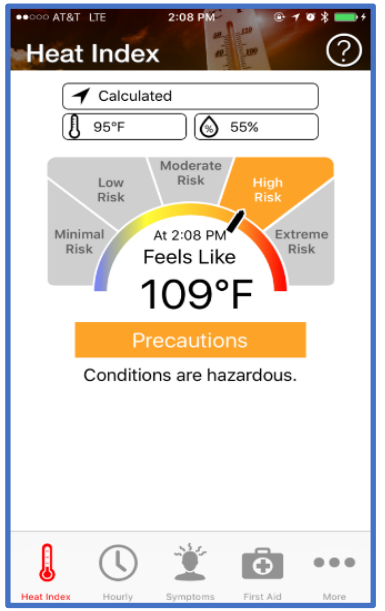
The Final 4

Manual material handling



Noise

Air contaminants



High temperatures

Photos – Earl Dotter and NIOSH

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Information outline for each topic

- ✓ What is the hazard?
- ✓ How severe/how common are health effects?
- ✓ What trades are most commonly affected?
- ✓ How should we look at this health hazard?
- ✓ What control strategies can be used?

Information outline for each topic (cont'd)

- ✓ Regulations and guidance
- ✓ How can trade groups help?
- ✓ **How can an IH help?**
- ✓ Take-away messages
- ✓ Additional resources

#1 Manual Material Handling

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Manual Material Handling

KEY MESSAGES

- MMH = leading cause of musculoskeletal disorders (MSDs)
- Major health impact
  - Painful, costly, disabling, likely to recur
  - Affects every age and trade
- Rx pain meds (opioids)
  - Medicated to keep working when injured vs. time off to recover
  - Construction overdose death rate 6 X higher than average industry rate, and highest overall # of overdose deaths of all industries.
- Strategies to reduce hazard
  - Pre-job planning, site and task setup
  - Tools

    --Lighter, comfortable grip, less vibration…

How to “look” at the hazard…

“WHAT Pace?” RISK Factors

- **W**eight
- **H**andling ease
- **A**wkward postures
- **T**ime/distance
- **Pace** → loads per shift

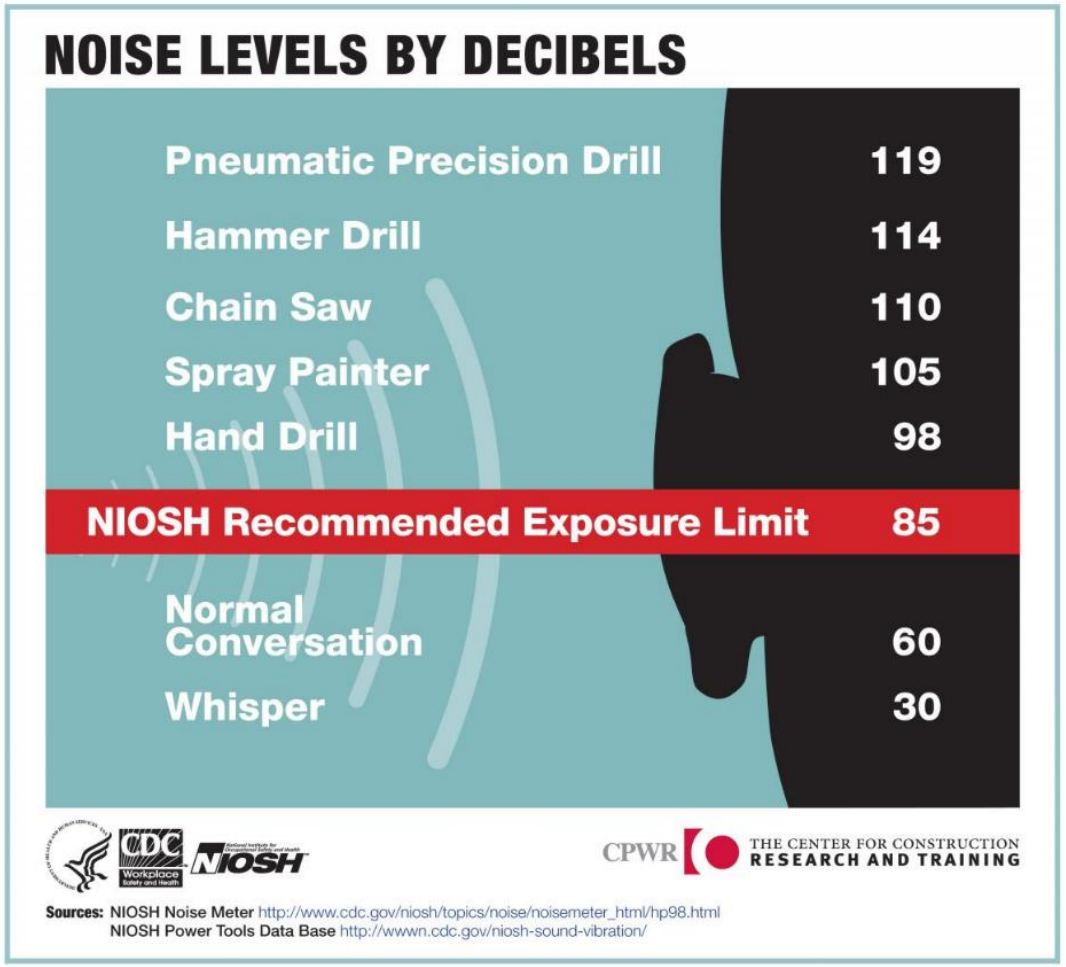
Photo: Earl Dotter

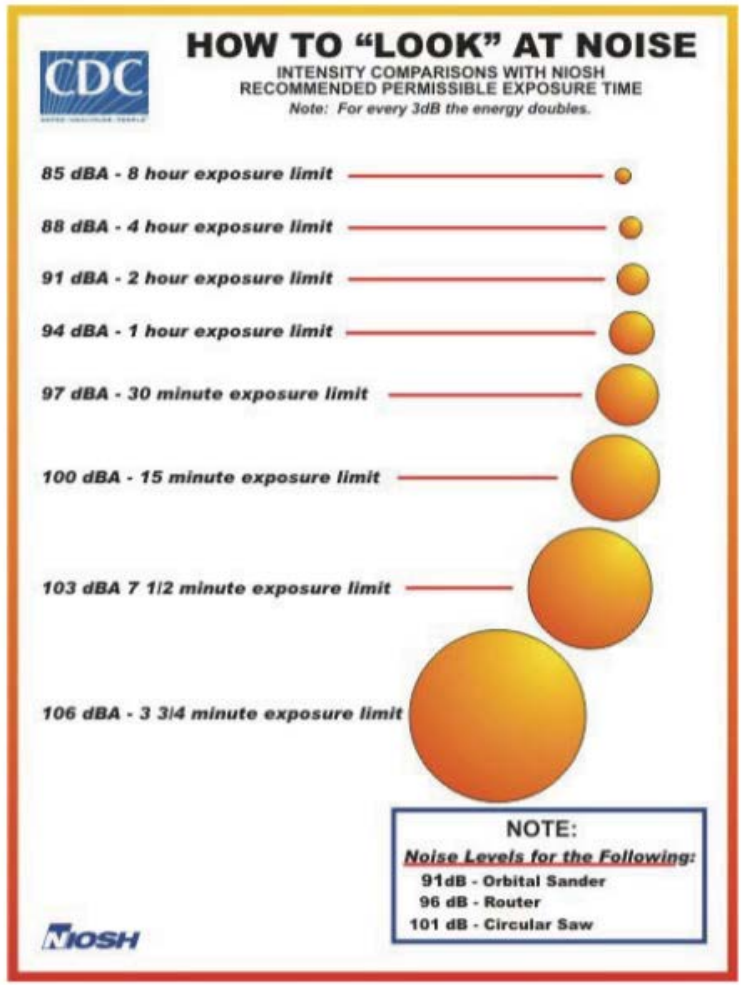
Links to NIOSH and other assessment tools

Risk Factors	YES	NO
1. General		
1.1 Does the load handled exceed **50 pounds**?		
1.2 Is the object difficult to bring close to the body because of its size, bulk or shape?		
1.3 Is the load hard to handle because it lacks handles or cutouts for handles, or does it have slippery surfaces or sharp edges?		
1.4 Is the footing unsafe? For example, are the floors slippery, inclined or uneven?		
1.5 Does the task require fast movement, such as throwing, swinging or rapid walking?		
1.6 Does the task require stressful body postures, such as stooping to the floor, twisting, reaching overhead or excessive lateral bending?		
1.7 Is most of the load handled by only one hand, arm or shoulder?		
1.8 Does the task require working in extreme temperatures, with noise, vibration, poor lighting or airborne contaminants?		
1.9 Does the task require working in a confined area?		
2. Specific		
2.1 Does lifting frequency exceed **five lifts** per minute?		
2.2 Does the vertical lifting distance exceed **3 feet**?		
2.3 Do carries last longer than **one minute**?		
2.4 Do tasks that require large sustained pushing or pulling forces exceed **30 seconds** in duration?		
2.5 Do extended reach static holding tasks exceed **one minute**?		

"Ergonomic Guidelines for Manual Material Handling"

#2 Noise


NOISE LEVELS BY DECIBELS
Pneumatic Precision Drill 119
Hammer Drill 114
Chain Saw 110
Spray Painter 105
Hand Drill 98
NIOSH Recommended Exposure Limit 85
Normal Conversation 60
Whisper 30
CDC Workplace Safety and Health NIOSH
CPWR THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING
Sources: NIOSH Noise Meter http://www.cdc.gov/niosh/topics/noise/noisemeter_html/hp98.html
NIOSH Power Tools Data Base http://wwwn.cdc.gov/niosh-sound-vibration/


CDC
HOW TO "LOOK" AT NOISE
INTENSITY COMPARISONS WITH NIOSH RECOMMENDED PERMISSIBLE EXPOSURE TIME
Note: For every 3dB the energy doubles.
85 dBA - 8 hour exposure limit
88 dBA - 4 hour exposure limit
91 dBA - 2 hour exposure limit
94 dBA - 1 hour exposure limit
97 dBA - 30 minute exposure limit
100 dBA - 15 minute exposure limit
103 dBA 7 1/2 minute exposure limit
106 dBA - 3 3/4 minute exposure limit
NOTE:
Noise Levels for the Following:
91dB - Orbital Sander
96 dB - Router
101 dB - Circular Saw
NIOSH

Noise

KEY MESSAGES

- Common…. but taken for granted
- Noise-induced hearing loss & tinnitus
  - Growing evidence: sleep disturbance, cardiovascular disease & high blood pressure, depression, balance problems
- Decibel scale misunderstandings (logarithmic)
  - Example: 85 vs 88 dBA

    - Only a small % higher numerically

    - But 100% (2X) louder on dBA scale

    (So allowable exposure time cut in half)

You should know…

- *…lifetime probability of developing hearing loss ~ 60 – 80% among all trades*
- *25-year-old carpenter's hearing ability ~ 50-year-old person not exposed to noise on the job*

Sidebar topics:

- Availability of noise apps
- Hearing protectors and NRR ratings
- Importance of training & hearing tests

Control strategies

Focus on noisiest tasks first

- Modify task
- Rent or Buy Quiet
- Move, isolate or restrict
- Noise barriers
- PPE and training

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#3 Air contaminants

Dust

Fumes & Gases

Vapors

Exhaust

Biological

Air contaminants

KEY MESSAGES

- Major health impacts… but low awareness and delayed onset for most health effects
- “Blindspot”: Short/infrequent, but intense exposure tasks
- Strategies:
  - Planning - include airborne hazards in JHAs
  - Consider key factors
    - Duration
    - Work environment
    - Tools
    - Tasks & available controls

Sidebar topics:

- Asbestos and lead
- How toxic?
- Do not overlook short tasks
- What is hot work?
- What are Safety Data Sheets?
- Many OSHA PELS are outdated
- Occupational Exposure Limits
- Selection and care of respirators

Control Strategies

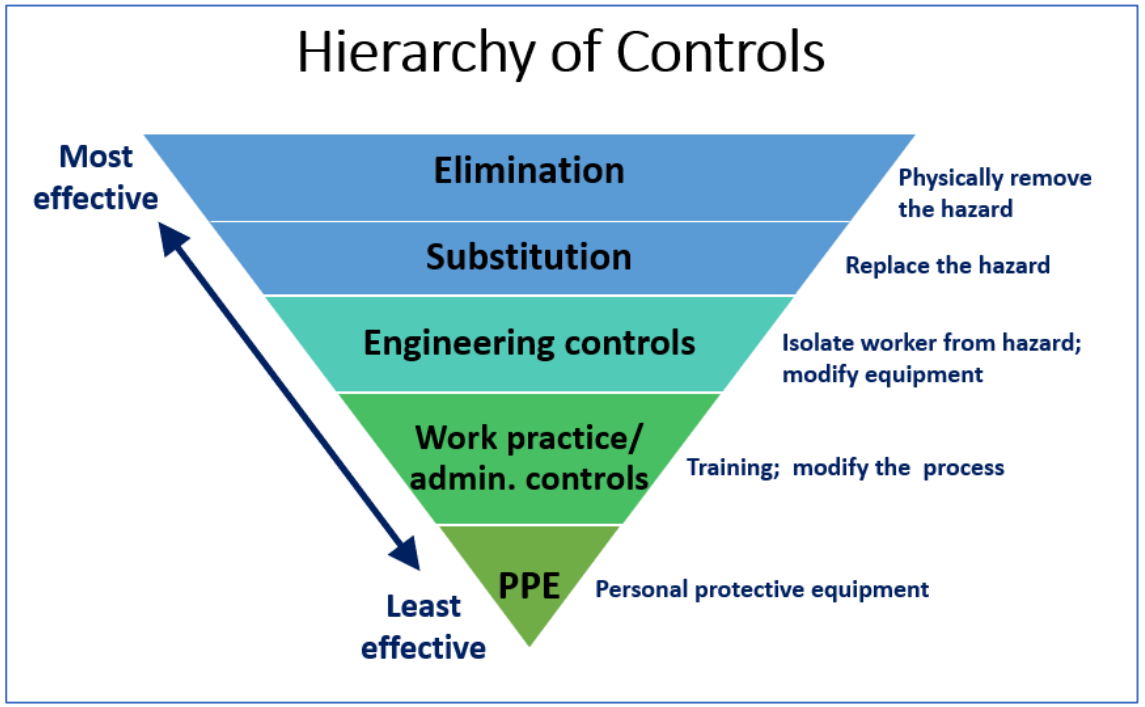

Photo: Lisa Capicik

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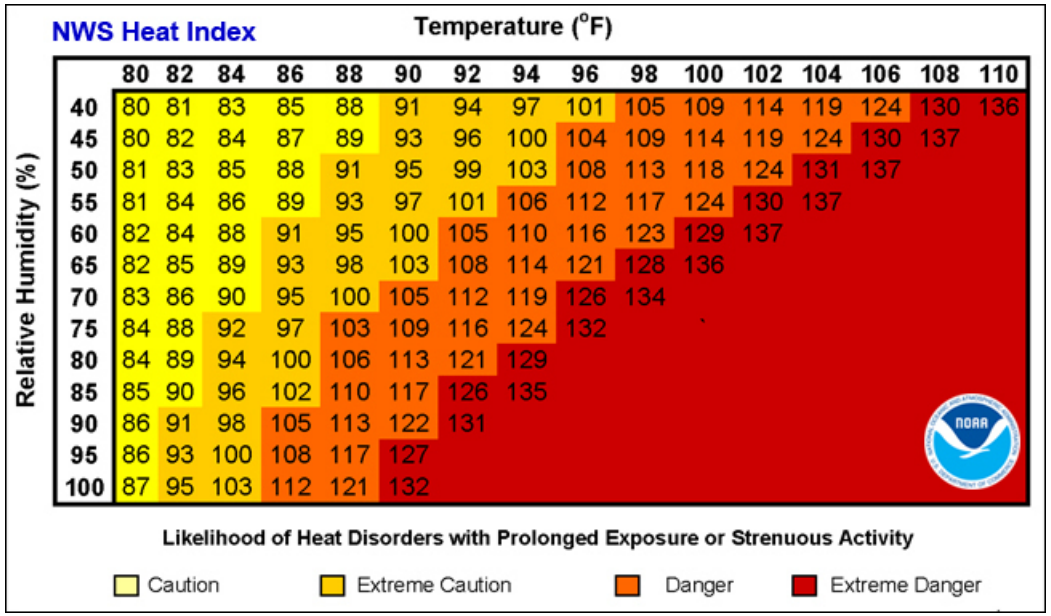
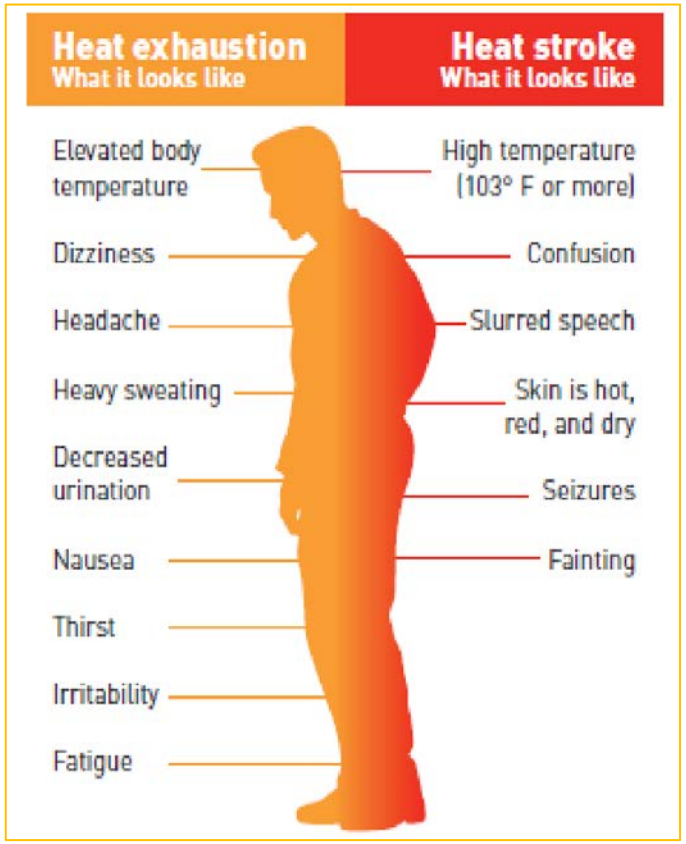
#4 High temperatures





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High temperatures (cont'd)

Key messages:

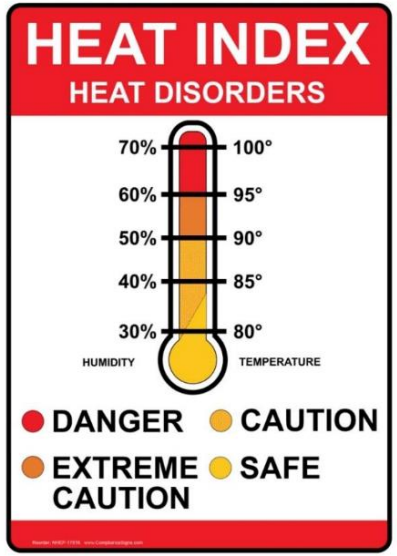
- **Focus on new workers and acclimatization**
- **Recognize the range of signs & symptoms and what to do**
- **Prevention**

These factors aggravate heat conditions.

- Working in direct sunlight
- Protective clothing, especially semipermeable or impermeable types
- Respirator use
- Hot work such as welding or working around steam
- Carrying additional weight from tools and protective equipment

High temperatures can also contribute to injuries

- Sweaty palms can lose grip.
- Fogged safety glasses can cause trips.
- Dizziness can cause falls.
- Hot surfaces can lead to burns.



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In closing…

- Health hazards → Real impacts
- Opportunities for action
- JHA / JSA – underutilized resource for health?
- Focus 4 for Health → Help get started
- Industrial hygiene & Safety collaboration
- Partnership & outreach opportunities

Thank you!

from the **#FocusFourConstructionHealth** Project Team

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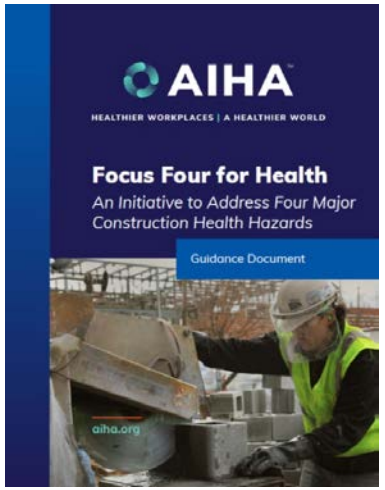

Questions? Outreach or partnership ideas?

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CPWR - The Center for Construction Research and Training

- A nonprofit organization established by NABTU (North America's Building Trades Unions) in 1990
- Located in Silver Spring, MD
- Activity areas: research, training and service
- NIOSH's National Construction Center
- Dedicated to reducing occupational injuries, illnesses and fatalities in the construction industry

www.cpwr.com

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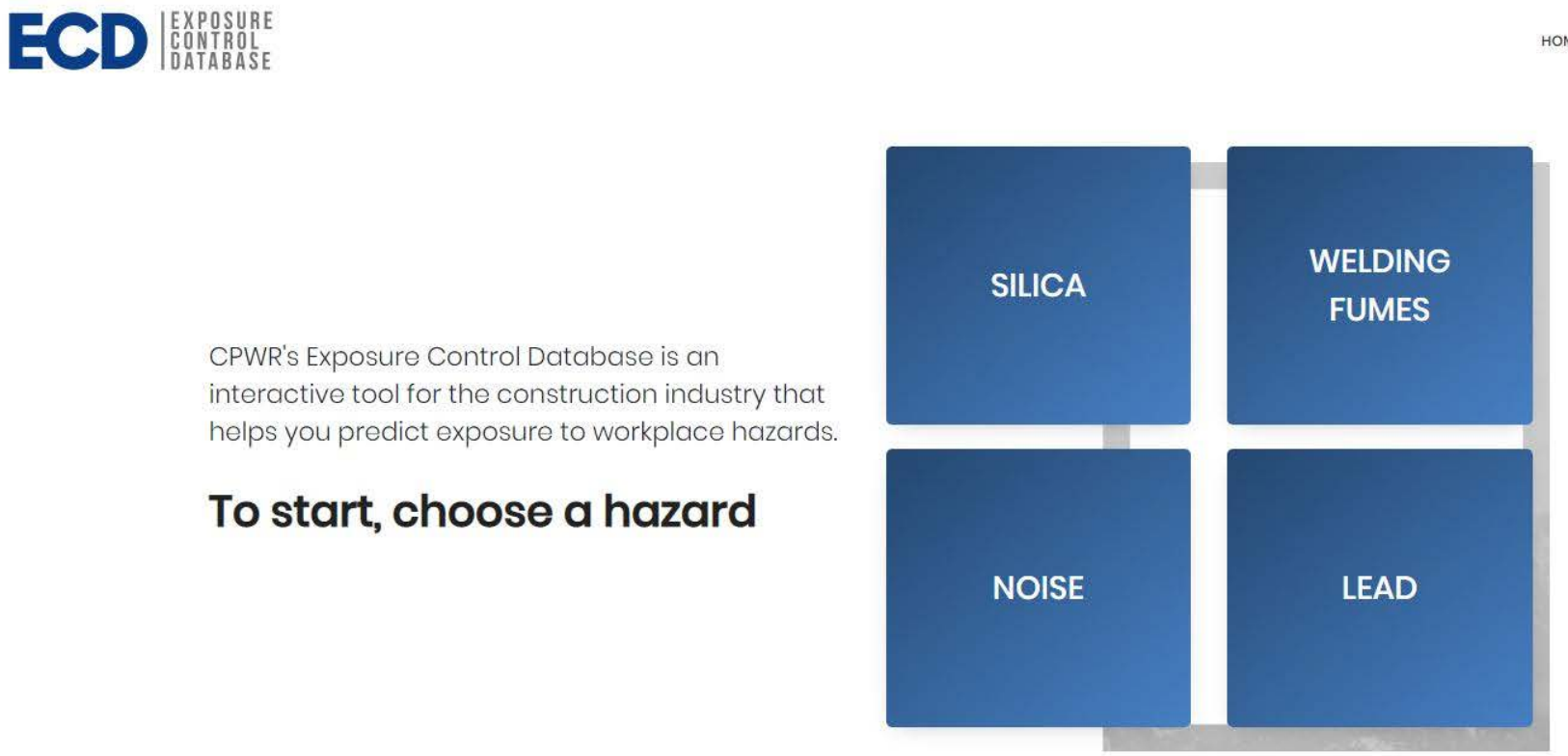
The Exposure Control Database

- A database of exposure measurements gathered from published literature, government reports, and partners in the industry.
- An interactive, web-based tool to help contractors estimate workers' exposure to four key hazards:
  - **Silica:** 876 measurements
  - **Noise:** 203 measurements
  - **Welding Fumes:** 186 measurements
  - **Lead:** 87 measurements
- A way to highlight the effectiveness of engineering controls
- Publicly available free of charge

Exposure Control Database

www.ecd.cpwrconstructionsolutions.org



Silica

What data is included?

- Task-based personal breathing zone measurements taken on construction sites and in lab settings.
- Measurements that represent typical process and can be attributed to a single task, tool, control method, etc.

What data is excluded?

- Worst-case measurements or measurements taken for compliance purposes.
- Summary statistics or measurements generated through computer simulation.

Who uses it?

- Over 2800 unique users in the US and 118 other countries over the past 12 months.
- Accessed by universities, private companies, nonprofits, insurance companies, contractors, local unions, and government agencies.

Welding Fumes, Lead, & Noise

Welding Fumes

- Measurements taken on live construction sites only
- Multiple analytes per measurement

Lead

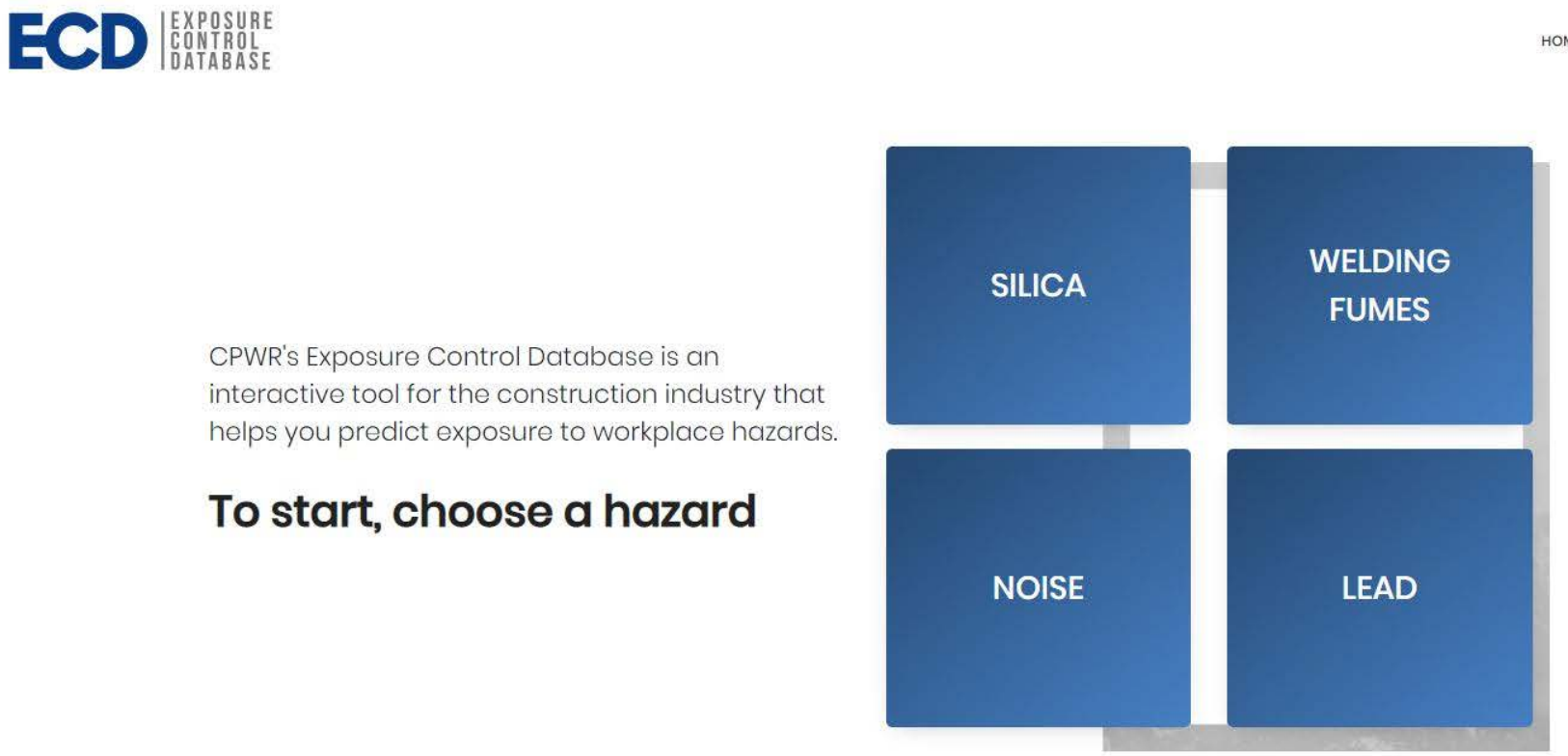
- Measurements taken at sites falling under the Renovation, Repair, and Painting Rule and Abatement Rule

Noise

- Measurements taken in a laboratory only
- Results displayed as % dose (OSHA and NIOSH)

Exposure Control Database – Walkthrough

www.ecd.cpwrconstructionsolutions.org



Data Sources

Challenges:

- Data availability
- Data quality
- Inconsistency in sampling methods

Solutions:

- CPWR has developed three sampling forms to streamline the data collection process and improve data quality
  - Silica Form
  - Noise Form
  - Welding Fumes Form

Data Collection Form – Silica

https://bit.ly/3tkZHV8

*CONTACT INFORMATION
Name:
Company:
Email:
Phone:

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Respirable Crystalline Silica Objective Data Collection Form

*DATE

***Note: All fields with an (*) are required**

SAMPLING LOCATION		
Site Name:	*State:	*Country:
Number of workers/Company Size:		
*Type of Worksite: ☐ Active worksite ☐ Simulated worksite ☐ Laboratory		
*Project Type: ☐ Renovation ☐ Demolition ☐ New Construction		
Comments:		

SAMPLING ENVIRONMENT			
*Environment: ☐ Outdoor ☐ Partial Enclosure[1] ☐ Indoor ☐ Confined Space			
*Temperature (°F):	*Relative Humidity (%):	Wind Direction[2]: ☐ Upwind ☐ Downwind ☐ Crosswind	Wind Speed (mph):
Comments:		Other Ventilation Sources:	

Data Collection Form – Noise

https://bit.ly/3NrcNb9

* CONTACT INFORMATION
Name:
Company:
Email:
Phone:

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Noise Data Collection Form

* DATE

***Note: All fields with an (*) are required**

*MEASURING DEVICE			
Device Type: ☐ Sound Level Meter ☐ Dosimeter ☐ Smartphone App			Phone type: ☐ iPhone ☐ Android ☐ Other
Pre-Calibration ☐ Post-Calibration ☐	External microphone? ☐ Yes ☐ No	Windscreen: ☐ Yes ☐ No	Make/model or app name:
Comments:			

SAMPLING LOCATION			
Site Name:	*Environment: ☐ Indoor ☐ Outdoor	Temperature (°F):	*Wind speed (mph):
Comments:			

EQUIPMENT INFORMATION	
*Tool type:	*Manufacturer:

Data Collection Form – Welding Fumes

https://bit.ly/3axclJW

*CONTACT INFORMATION
Name:
Company:
Email:
Phone:

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Welding Fumes

Task-Based Data Collection Form

*DATE

*Note: All fields with an (*) are required.

PROJECT INFORMATION		
Site Name:	State:	Country:
*Type of Worksite: ☐ Active worksite ☐ Simulated worksite ☐ Laboratory		
Project Type: ☐ Renovation ☐ Demolition ☐ New Construction		
Comments:		

SAMPLING STRATEGY	
*Pump Inlet Location: ☐ Inside Welding Helmet ☐ Outside Welding Helmet	
*Welding Helmet Type: ☐ Standard ☐ Welding Helmet with Integrated Respirator	
*Sampling objective: ☐ Worst-case ☐ Representative	Comments:

HOT WORK PROCESS
*Type of Hot Work (i.e. SMA, TIG, MIG, FCA, brazing, soldering, plasma cutting, oxyacetylene cutting):

Thank You!

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