



# SEEING THE WHOLE JOB ISN'T ENOUGH

Identifying Hidden Ergonomics  
Risks



# MEET YOUR PRESENTER



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# AGENDA

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# LEARNING OBJECTIVES



## LEARNING OBJECTIVES:

1. **Differentiate** between ergonomic risk factors that are effectively captured by whole-body assessment methods and those that require body region specific evaluation.
2. **Assess** workplace scenarios to determine when targeted upper-extremity assessment methods should be incorporated into an MSD risk management process.
3. **Compare** AI advancements in hand-intensive assessments with the evolution of whole-body ergonomic assessment methods.

Business  
CostLIBERTY MUTUAL 2025 WSI REPORT FOR TOP 10 CAUSES  
OF WORKPLACE INJURIES: MSD RELATED

1

Overexertion involving  
outside sourcesCost per year: **\$13.7B****Watch for heavy loads**Do workers have access to  
equipment that reduces the  
need to lift heavy items?

5

Other exertions or  
bodily reactionsCost per year: **\$3.9B****Watch for exiting a vehicle**Are ergonomic measures  
implemented wherever possible?

9

Repetitive motions  
involving microtasksCost per year: **\$1.8B****Watch for hand- and  
shoulder-intensive work**Do engineering controls reduce forceful  
exertions and enable good postures,  
and does scheduling allow for breaks?

# BUSINESS IMPACTS OF ERGONOMICS DONE RIGHT

## Productivity

Improved workflow efficiency and reduced downtime. A 5% increase in productivity efficiency is linked to ergonomic intervention.

## Quality

Fewer errors and defects when worker fatigue and discomfort are addressed. 1% increase in first-time quality production.

## Employee Engagement

Workers feel valued when well-being is prioritized, reducing voluntary turnover and boosting retention.

## Financial Performance

Research links ergonomics investment to stronger stock performance, better credit ratings, and \$5 return per \$1 invested.

*Tomba E, Dolinschi R, Natale J. (2013). Economic evaluation of a participatory ergonomics intervention in a textile plant. Appl Ergon. 2013 May;44(3):480-7.*

SEC. 01

# HANDS DIFFERENTIAL

# ERGONOMICS IN INDUSTRY

**Goal:** Design work environments, products, and tasks that are compatible with human capabilities and limitations

## Common Focuses:

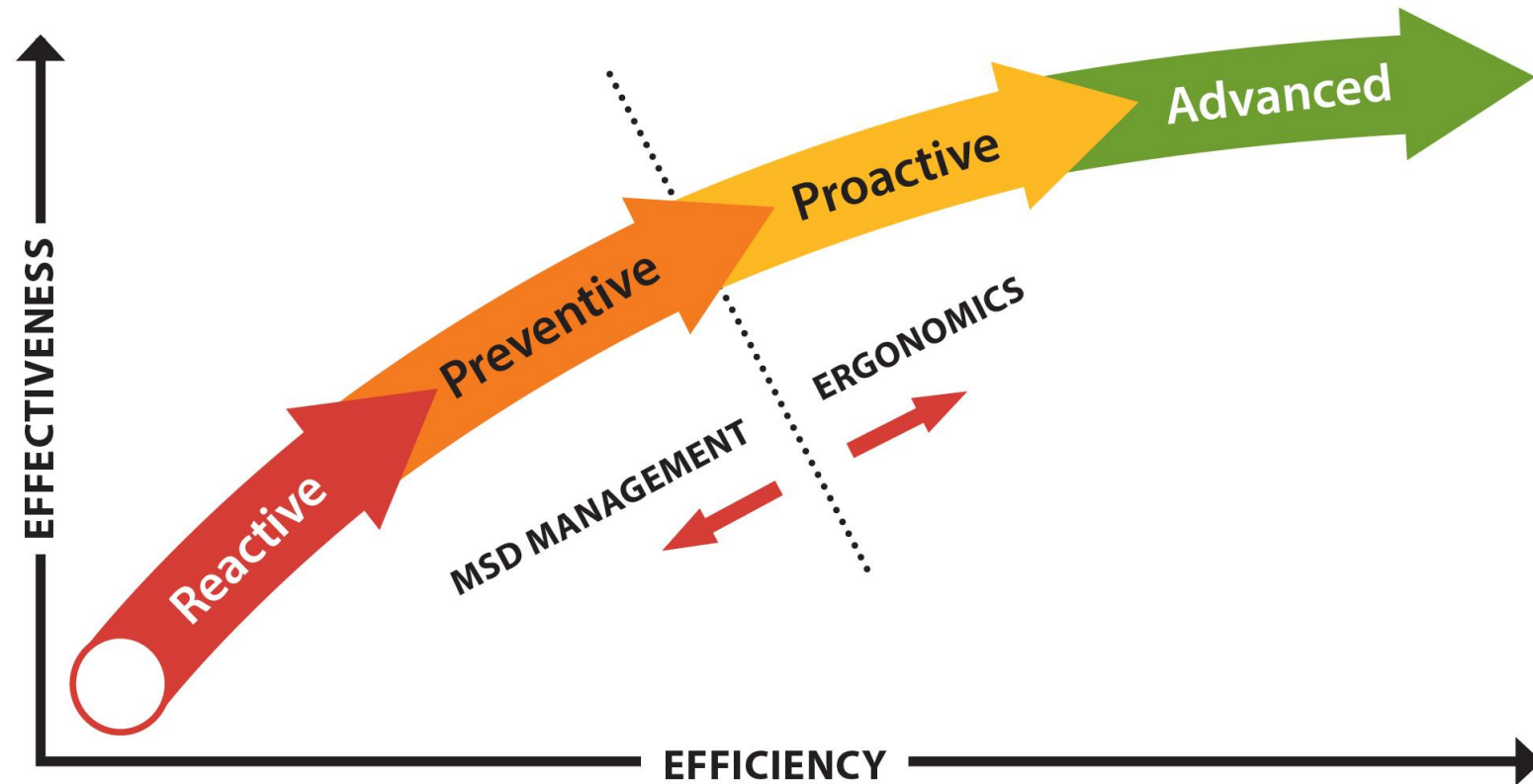
- Total Worker Health (NIOSH)
  - + i.e. Time Weighted Brief, REBA, Quick Exposure Check
- Large Muscle strain – specifically the back
  - + i.e. Revised NIOSH Lifting Equation, 3DSSPP, Snook & Ciriello push/pull/carry tables



# ERGONOMICS PROCESS MATURITY CURVE

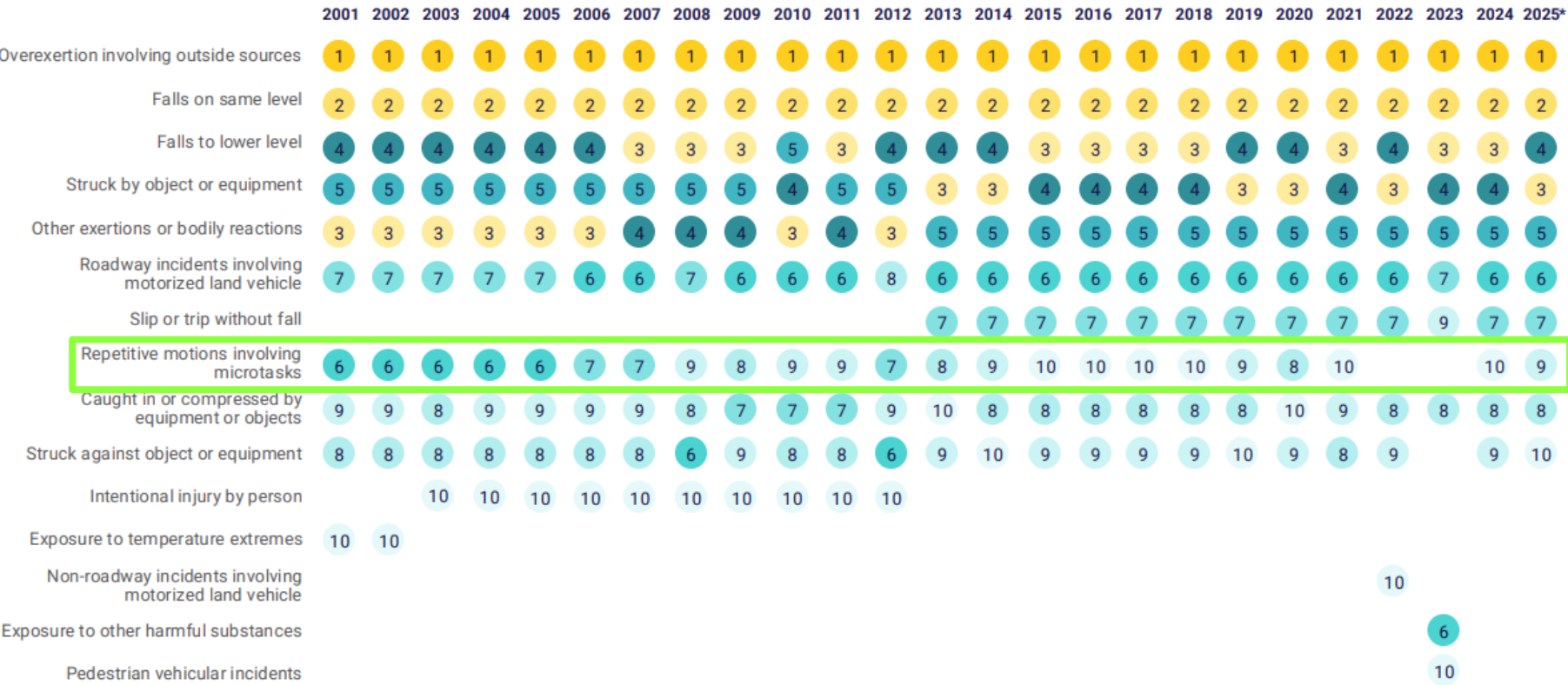


## Ergonomics Maturity Curve®



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LIBERTY  
MUTUAL 2025  
WSI REPORT



\* Most differences from this year's top 10 attributed to a coding change in 2013 or to COVID-19 in 2023 (WSI publication years represent data from 3 years prior)

# WHY ARE THE HANDS DIFFERENT?

## HOW MANY TIMES A DAY YOU USE YOUR HANDS?

Hand injuries also have a much great impact on an operator's quality of life.

Non-engineering improvements are almost nonexistent for Hand intensive work tasks → Unlike other body regions, hands do not get to “clock out.”



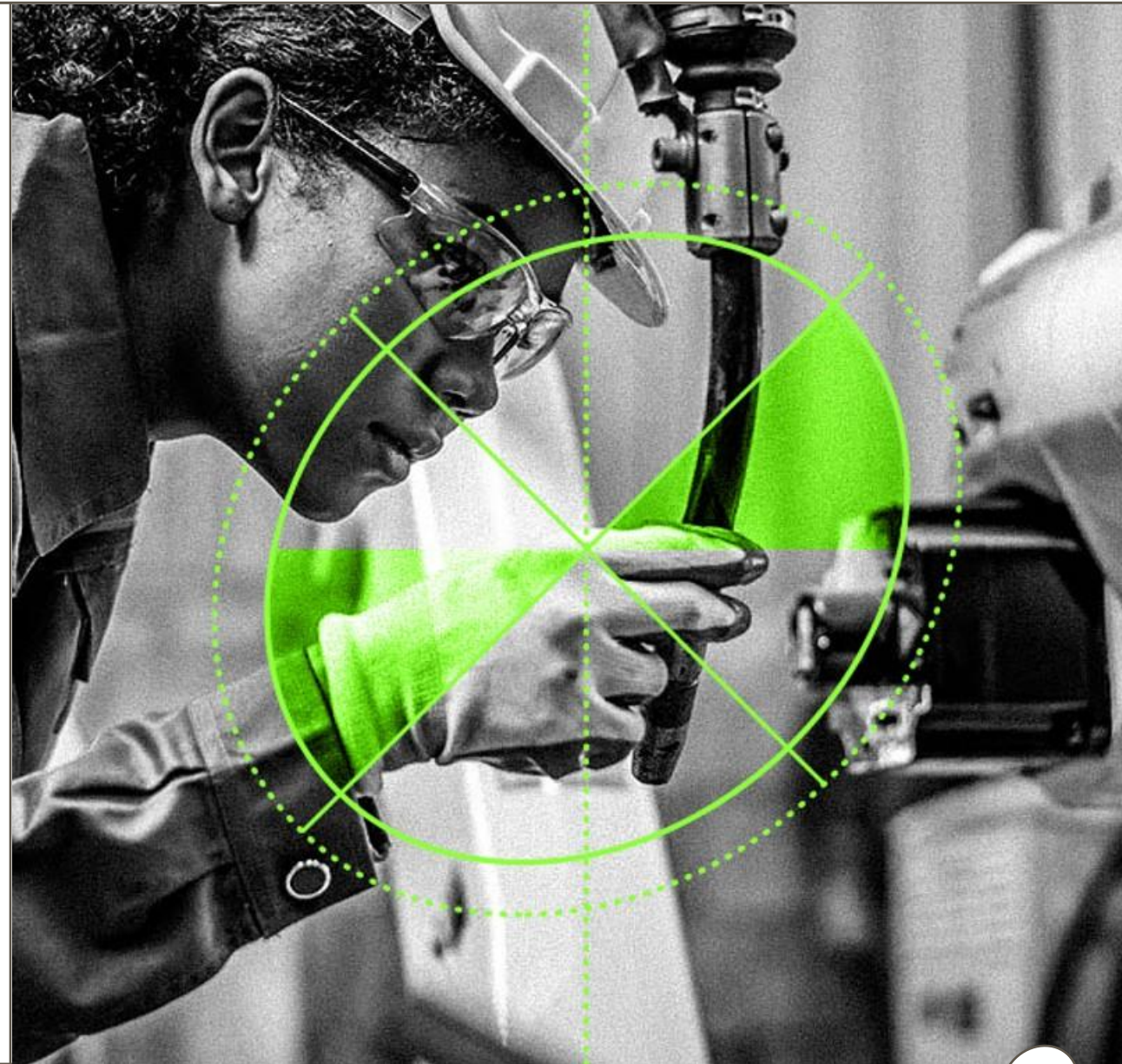
# WHY ARE THE HANDS DIFFERENT?

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Are we doing enough to protect hands and wrists?



SEC. 02

# MISSING RISK

# OBSERVATION-BASED PRIORITIES

## CAN YOU SEE THE HANDS?

- Whole-body assessments naturally focus attention on large movements.
- Small, repetitive motions disappear in the "big picture."
- This is a limitation of assessment resolution, not a flaw in whole-body tools.



# BODY REGION SPECIFIC ASSESSMENT TOOLS

## Goals

- ✓ Improved understanding of actual MSD risk
- ✓ Increased specificity for targeting improvements
- ✓ Documenting risk reduction

## Tooling Options:

- Distal Upper Extremity Tool (DUET)
- HAL
- Strain Index
- RULA\*

*\*RULA is upper limb specific, but not specific to the hands/wrists.*



## WHEN SHOULD I COMPLETE A HANDS SPECIFIC RISK ASSESSMENT?

### A SPECIFIC TOOL FOR A SPECIFIC WORK TYPE

Similar to Manual Material Handling evaluations, the Hands Intensive assessments are only necessary for jobs where a Whole-Body MSD Risk Assessment is likely to underestimate the risk to the hands.

Some examples would be:

- ✓ Small parts assembly, especially when seated
- ✓ Prolonged grinding tasks
- ✓ Precision work such as prepping test samples

# RISK ASSESSMENT TOOL TYPE EXAMPLE

## Scenario:

*An operator uses a pipette to draw a specific amount of a solution from a product vial for sample testing in the lab. The pipette is then emptied into a series of test vials for various quality tests for this batch of product. Once all of the vials are filled they are loaded in*

WHAT MSD RISK ASSESSMENTS SHOULD I COMPLETE TO ENSURE I HAVE CAPTURED THE NECESSARY LEVEL OF DETAIL TO DRIVE GOOD IMPROVEMENT DECISIONS?



SEC. 03

# WHAT'S CHANGING

# ERGONOMICS INNOVATION HISTORY: WHOLE BODY ASSESSMENT



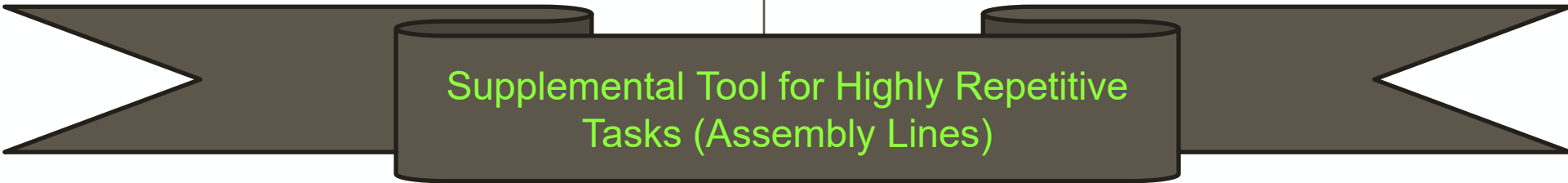
# HAND INTENSIVE TOOL EXAMPLE: STRAIN INDEX

## Pros:

- Broadly recognized technical tool built on well-documented MSD risk factors.
- Clarity
- Sensitive to small changes
- Understands short cycle times

## Cons:

- Technical Skill requirements
$$COSI = RSI_1 + \sum_2^n \Delta RSI_i$$
- Applicable only to upper extremity tasks
- Assumes relatively steady tasks



Supplemental Tool for Highly Repetitive Tasks (Assembly Lines)

# ERGONOMICS INNOVATION HISTORY: HAND INTENSIVE

Most commonly used risk assessment tools that focus on Hand Intensive tasks are:

- Manual
- Based primarily on human observation
- Require Subject Matter Expertise





## AI INTEGRATION WITH HAND INTENSIVE ASSESSMENTS

- Improved efficiency
- Expanded risk assessment data set
- Better consistency without requiring experts
- All the benefits of AI risk assessments, focused on Hands and wrists
  - + Supplemental tools
  - + Expanded support availability

# QUESTIONS?





## THE ERGONOMICS JOB IMPROVEMENT PROCESS

Scan the QR code now to download the eBook.

Learn four key steps to successfully managing the tactical elements of your ergonomics process, written by certified ergonomics experts.

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