

Material Handling Obstacles – When you must move the **ROCK!!**



Drew Bossen - Atlas IPS

Lisa Krefft - MyAbilities

Scott Ege - Ege Worksmart Solutions



Drew Bossen, PT, MBA, is the Executive Vice President of Atlas Injury Prevention Solutions. He has a strong clinical background rooted in the assessment and evaluation of the injured worker. Over the past 30+ years he has worked with numerous organizations across the country providing organizational solutions in ergonomics, pro-active safety and wellness. His strengths lie in clinical application and systems thinking.



Lisa Krefft OTR/L, MSLc is Vice President of Partner Relations at MyAbilities Technologies. Lisa has provided on-site employer prevention & rehabilitation programs for national multi-site employers and insurers, delivering superior outcomes with average 4:1 ROI. Having acquired unique operational knowledge across industry sectors over her 30-year career as an OT, Lisa's passion is working with customers in their pursuit of workplace safety to implement innovative solutions integrating technology to transform safety culture.



Scott Ege, PT, MS is President of Ege WorkSmart Solutions PC. Scott has provided comprehensive and integrated solutions for manufacturing, office, retail, and healthcare industries throughout his 30-year career. Scott is the creator of the innovative and nationally recognized programs titled Stretch It Out!® and PowerMoves™.

Our Challenge...

- We were challenged with developing a SUSTAINABLE material handling solution when the deployment of traditional material handling aids/tools were not feasible; sometimes you must move the ROCK (aka: mattress, sofa, or dresser).



Our Challenge



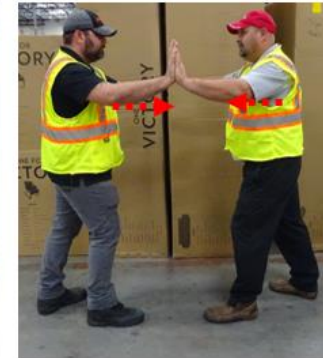




Centered



Close



Wide Base

Our Challenge... Quantify the Affect



- Material handling training has always gotten a bad rap as being less than effective in reducing risk.
- To dispel those concerns, we have engaged in a study utilizing an advanced motion capture technology to quantify the reduction of:
 - Ranges of motion and
 - Muscular recruitment

Lift, Carry, Push, Pull



Traditional Training Approaches

- Classroom Lecture (i.e. “Back Class”)
- Demonstration
- “keep your back straight & bend your knees”
- Now, go back to work...
- Zzzzzz
- Result????



How do we get people moving better and reduce the risk of injury??

Challenge Worker Thinking

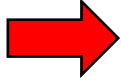
No pain = Safe



Workers don't watch themselves work



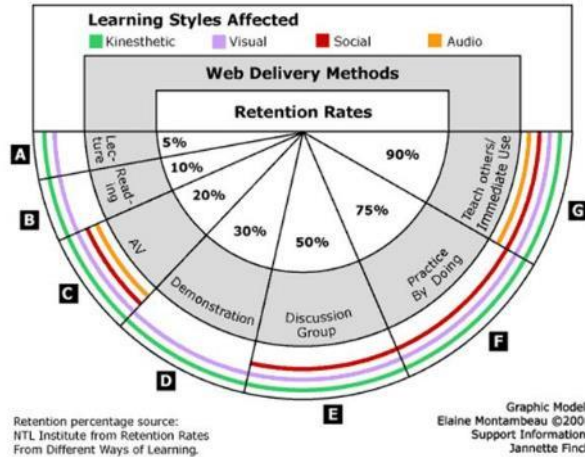
Movement & Risk (Demand)



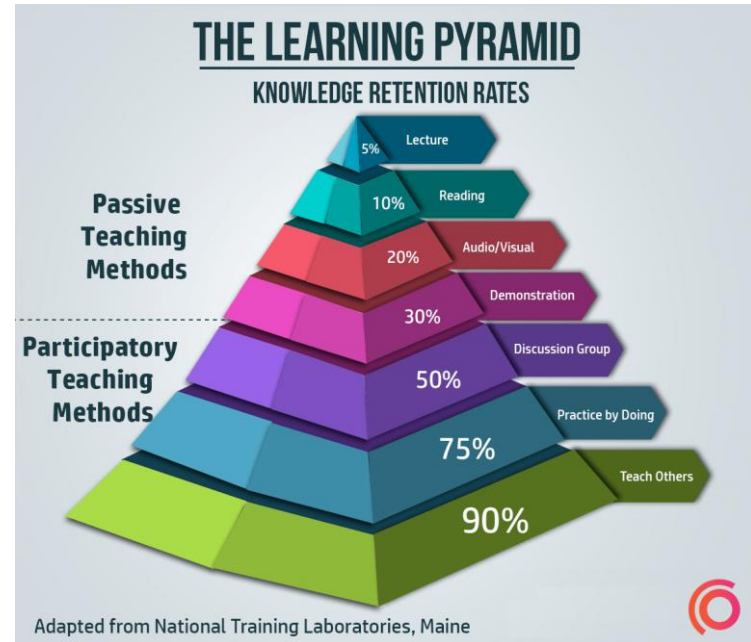
- Standardize work methods and tools
- Recognize & change high risk behaviors
- Choices = Consequences
- Musculoskeletal Health
- Create ENGAGEMENT
- Keep it Simple!!

Learning Model: Engagement

Learning and Retention



NTL Institute. (2000). Retention Rates from Different Ways of Learning.





Power Moves™



- Train-the-Trainer Model
- Job-specific / Customized
- Participatory (experiential learning)
- Ergonomics
- Library of “Moves”
 - lifting, pushing, pulling, cranking...
 - postures, positions



- Musculoskeletal Health
 - recovery
 - wellness
- Application – immediate impact
- Employer & Employee both benefit
- Holistic Approach



The Moves...You Gotta Feel It!



“Centered”

The head, shoulders, arms, and trunk are essentially **CENTERED** within the workers “invisible cylinder”.

From an energy or strength standpoint, the more we put our head or arms outside this cylinder, the more our MPG decreases.



Validation?



- “More Than a Feeling”
- Reduce Demand
 - EMG
 - Movement
- Methodology
- “Core” Moves
- All Moves

Validation?



Movement

- body part / area



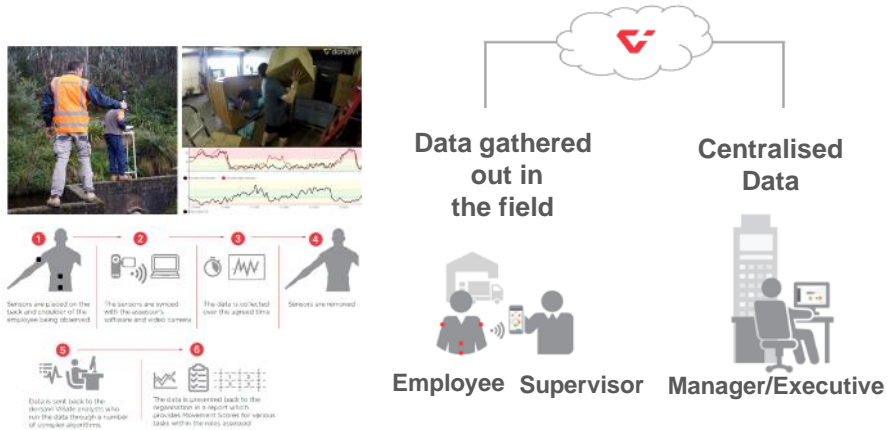
Demand

- body part / area



Technology Approaches

WEARABLE SENSORS



ViSafe™
powered by **dorsaVi™**

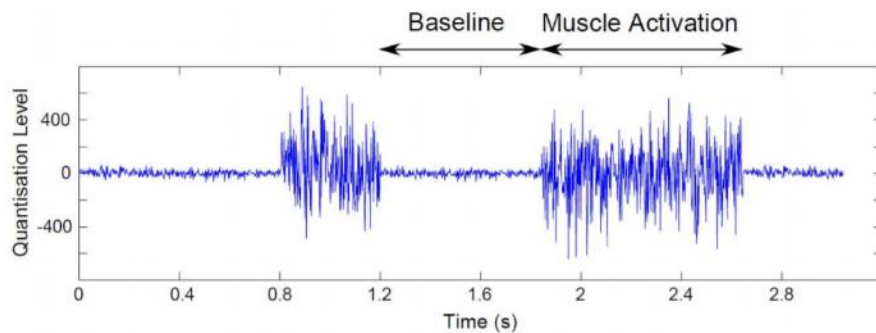
myViSafe™
powered by **dorsaVi™**

Artificial Intelligence- PDAi

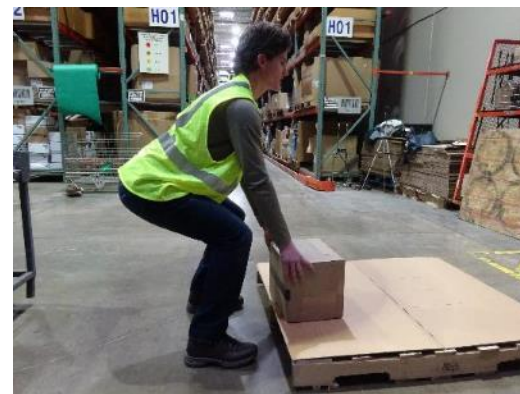


myabilities

What are we measuring?



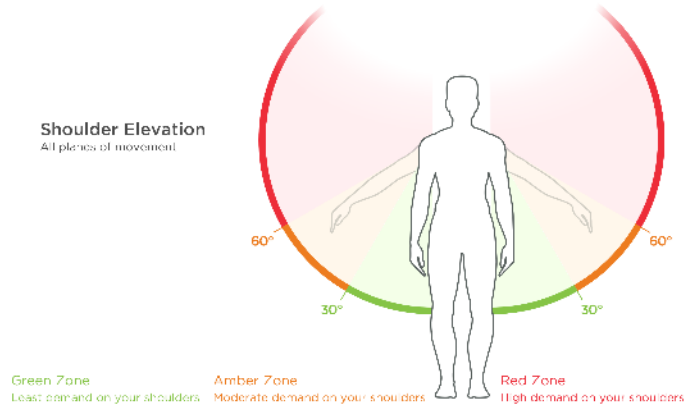
EMG – Muscular Recruitment



Measuring Movement

ViSafe Shoulder Movement Zones

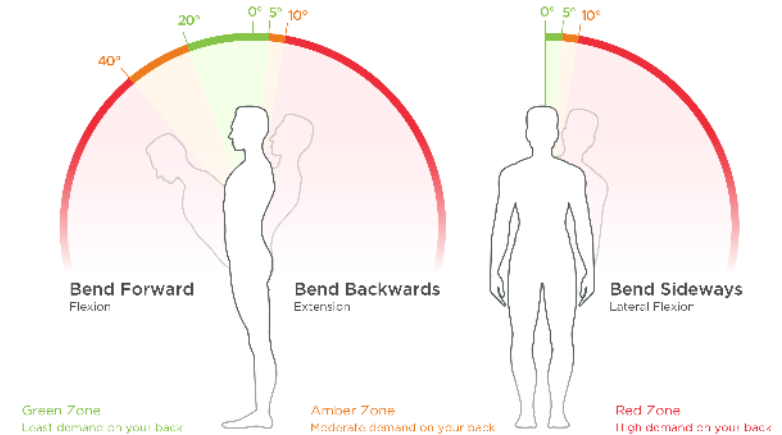
Colour coded zones indicate shoulder movement risk level



Shoulder

ViSafe Low Back Movement Zones

Colour coded zones indicate lumbar movement risk level

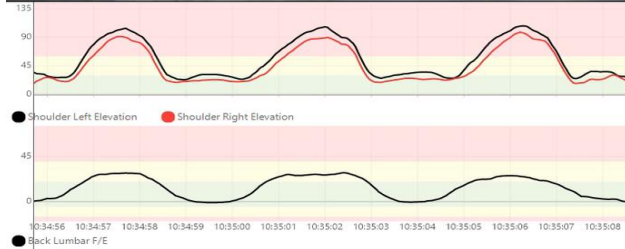


Back

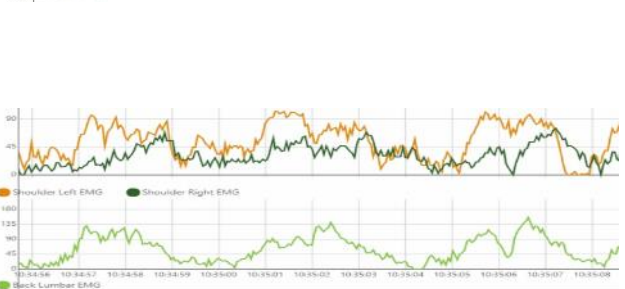
Power Moves Validation- “Centered”



SHOULDER
ELEVATION

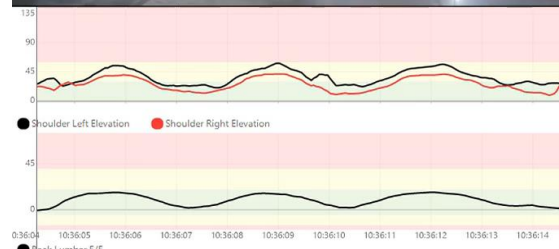
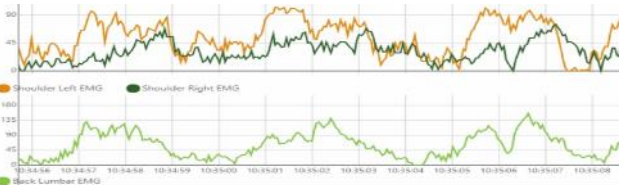


BACK
FLEX/EXT



SHOULDER
EMG

BACK
EMG



PowerMoves™ Improves Safety & Efficiency:

- “Centered” reduced the amount of time workers spent in moderate to higher risk movement zones by **100%** for the shoulders and **87%** for the low back.
- Moving more efficiently with Centered reduces muscle fatigue via EMG by **79%** for the shoulders **44%** in the low back

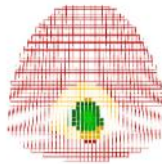
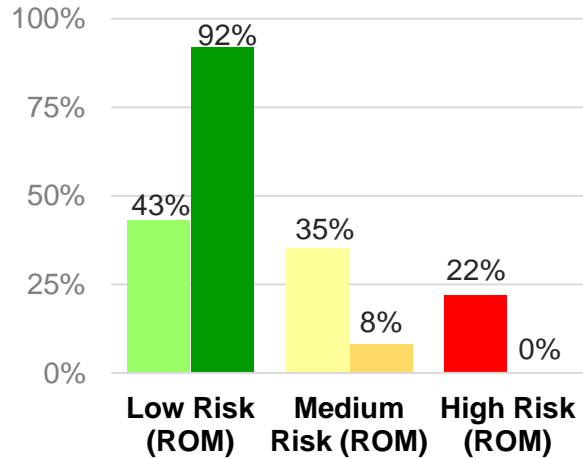
Powerful Results



		Movement	Fatigue (EMG)
CORE	Center	100% reduction in time spent in moderate to high risk zones for the shoulders	38% reduction in shoulders
	Wide Close	94% reduction in time spent in moderate to high risk zones for the back <i>*% reduction relates to time spent in specified movement zones</i>	32% reduction in back <i>*EMG measures are an average of the worker's muscle activity over task the whole task</i>

Higher Demand (Risk) ➡ **Lower Demand (Risk)**

Lower Back

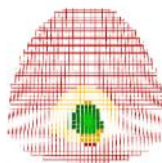
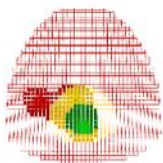
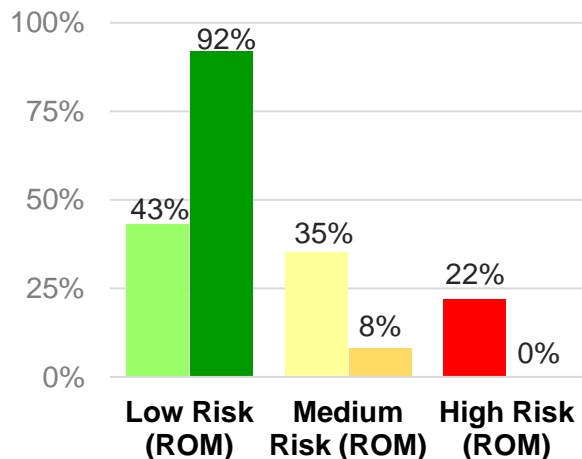


“Centered”

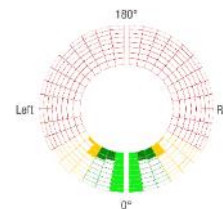
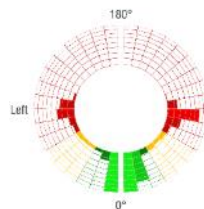
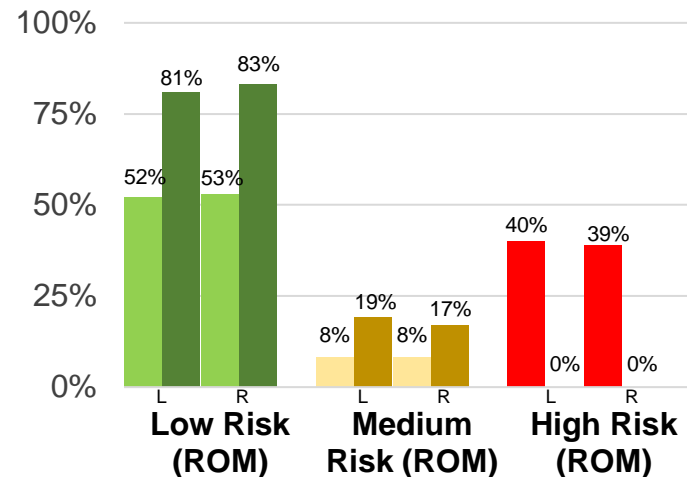


Higher Demand (Risk) → **Lower Demand (Risk)**

Lower Back

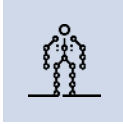


Shoulders

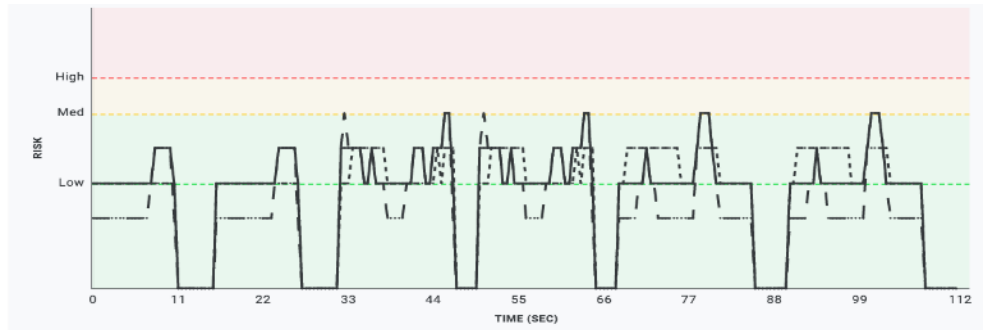


Preventing Injury with Risk Analysis and daily coaching using PDAi

Record, Upload see Risk...



AI generates a report of human skeletal motion and injury risk exposure to work activity directly from cell phone videos.



On-Site or Remote PowerMoves™ Job Specific coaching & validation

POWERED BY **m**obilities

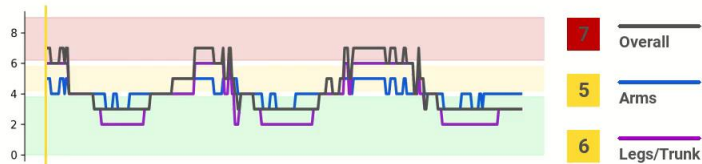
PDAi Summary Report

Task: Lift Crate - BAD

Repeatedly lift weighted crate using a stoop lift posture



Risk Score (RULA*)



Task Intervention: Investigate and change immediately

Summary (NIOSH**)

1

Lift 1

RWL = 14.2 kg

[0.78, 1.0, 0.87, 1.0, 0.91, 1.0]

2

Lift 2

RWL = 16.4 kg

[0.87, 1.0, 0.9, 1.0, 0.91, 1.0]

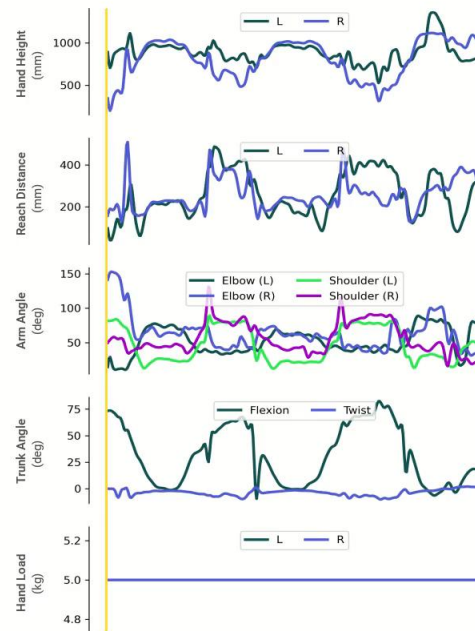
3

Lift 3

RWL = 15.8 kg

[0.87, 1.0, 0.87, 1.0, 0.91, 1.0]

Joint Kinematics and Hand Loads



*McAtamney & Corlett (1993) Applied Ergonomics 24(2): 91-99

**Waters et al. (1993) Ergonomics 36(7): 749-776

On-Site or Remote PowerMoves™ Job Specific coaching & validation

POWERED BY **m**obilities

PDAi Summary Report

Task: Lift Crate - GOOD

Repeatedly lift weighted crate using a squat lift posture



Risk Score (RULA*)



Task Intervention: Investigate further and change soon

Summary (NIOSH**)

1

Lift 1

RWL = 13.1 kg

[0.87, 0.83, 0.87, 1.0, 0.91, 1.0]

2

Lift 2

RWL = 13.1 kg

[0.87, 0.83, 0.87, 1.0, 0.91, 1.0]

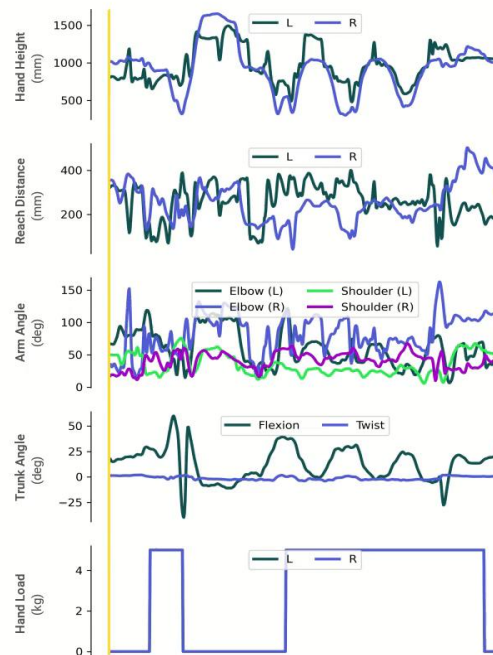
3

Lift 3

RWL = 15.8 kg

[0.87, 1.0, 0.87, 1.0, 0.91, 1.0]

Joint Kinematics and Hand Loads

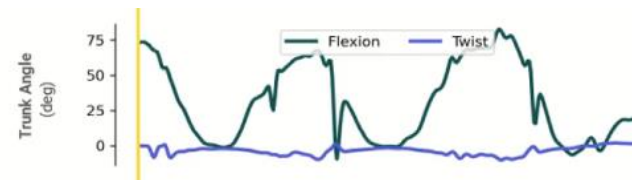
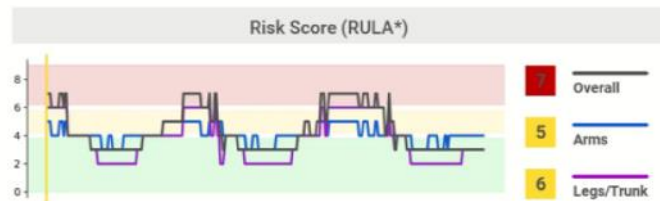


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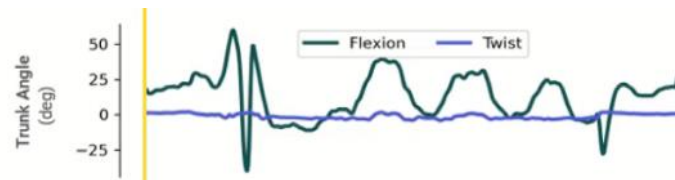
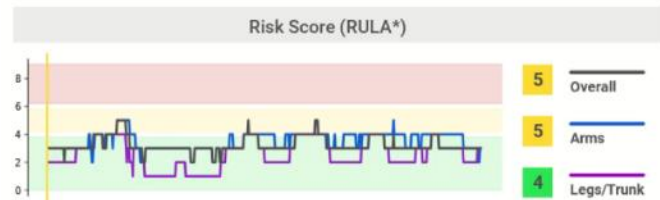
**Waters et al. (1993) Ergonomics 36(7): 749-776

On-Site or Remote PowerMoves™ Job Specific coaching & validation

Not Centered



Centered



Conclusion

“Centered” significantly reduces the overall risk score

More to come in 2020-2021!!

Our Challenge...

- We were challenged with developing a SUSTAINABLE material handling solution when the deployment of traditional material handling aids/tools were not feasible; sometimes you must move the ROCK (aka: mattress, sofa, or dresser).



Outcomes...

Global Warehouse / Transportation / Logistics Employer



Pilot Launch: Three Warehouse locations

Measures	2019	2020	Result
Sprain / Strain Injuries (OSHA Recordable)	3	0	↓ 100% Reduction
Lost Time Injury	1	0	↓ 100% Reduction
Restricted Duty Days	285	14	↓ 95% Reduction
Near Miss Reports	129	65	↓ 50% Reduction
Information Only Report	22	74	↑ 235% Increase

Outcomes...

First to Final Mile Concierge Delivery Service



**28%
Reduction
in Lost
Time
Injuries**



Next Steps & Questions

Drew Bossen, PT, MBA
Atlas Injury Prevention Solutions
dbossen@atlas-ips.com
Call|Text|Fax: 616-607-6980
Mobile: 319-430-3382 (Best Choice)

Lisa Krefft, OTR/L, MSLc
MyAbilities Technologies
lisa.krefft@myabilities.com
Mobile: (708) 259-2523

Scott Ege, PT, MS
Ege WorkSmart Solutions, PC
scott@egesolutions.com
Mobile: 815-988-7588



Power Moves™

Manual Material Handling Bootcamp Case Study



2020



Brock Anderson MS, CPE, LSSBB, CSCS
Owner & Principal Consultant



Jayne Welliver ASP
Safety & Loss Prevention Mgr.





1. Provide **educational information** that can be utilized with your employees.
2. Showcase the **training infrastructure** which has been proven successful.
3. Provide a **case study results** and testimonials from past/current participants.

Overexertion Injuries

Top 10 Causes and Direct Costs of the Most Disabling U.S. Workplace Injuries^{1,2}



Overexertion Injuries



What is Manual Material Handling?

Any handling task involving the human body as the main "power source".

- Lifting
- Lowering
- Pushing
- Pulling
- Carrying
- Holding
- Resisting

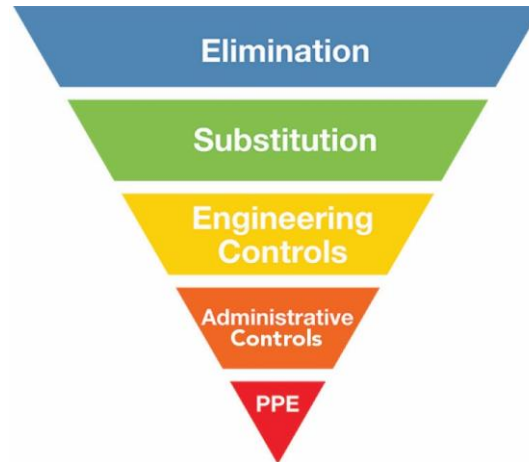


Reduce Overexertion

Inside 4 Walls



- Supplier Box Weight
- Warehouse Optimization
- Engineering Labor Standards
- Equipment
- Job Rotation



Dynamic Environment



- Behavior Change
- Safety Lifting Techniques

Voice of the Customer(s) Sampling

“We need training that is **customized** to our operations.”

- Jason Broshear
Director EHS



“Our employees respond best to **hands on** application.”

- Danielle McDonald
Warehouse Manager



“Retention is key. We want employees to have a **positive** and memorable **experience**.”

- Erin Smith
Safety Manager

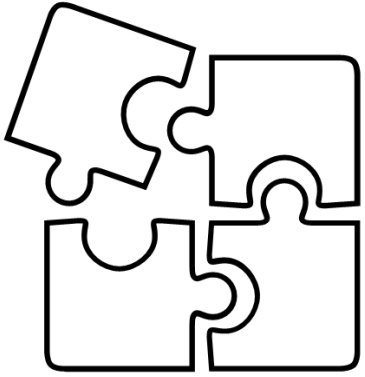


“Conducting training **without disrupting operations** is a huge plus for us.”

- Rachel Maccabee
Director Risk Management



Value Add Elements



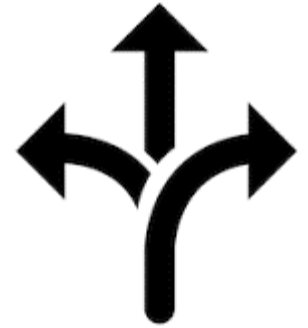
Customized
(Applicable)



Hands On
(Engagement)



Memorable
(Impactful)



Flexible
(Agenda)

Infrastructural Components



Learn It
(Classroom)



Do It
(Obstacle Course)



See It
(Video Analysis)



Learn It

Classroom Training & Hands On Activities



1. BASE OF SUPPORT – SPREAD YOUR FEET

If your legs are together, the stress from MMH will be on your lower back. Keeping a wide stance allows larger muscles in the legs to do the work.

- Helps maintain balance
- Distributes weight of load to large leg muscles
- Provides strength and stability



2. KNEES BENT – BEHIND TOES

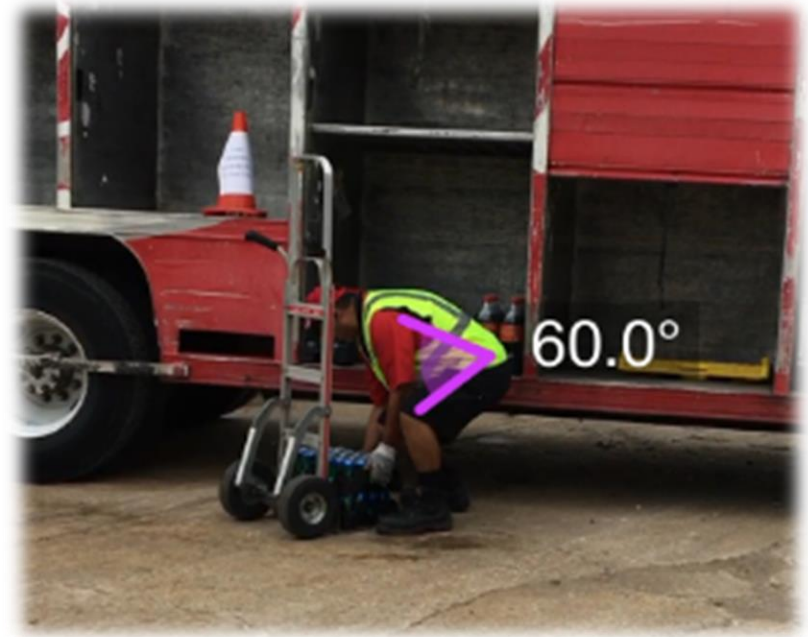


Knees past toes puts great amount of stress on knee joint. This can lead to injury.

Notice: For this to be accomplished heels will need to stay on the ground.

3. KNEES BENT – BACK STRAIGHT

Postural positions that make you more “Powerful”



HOW TO HAVE GOOD POSTURE:

Pretend you have an imaginary rope attached to the top of your head. Pull that rope up to the sky and your posture will improve!

4. AVOID TWISTING – “Point your Toe & Before you Go”

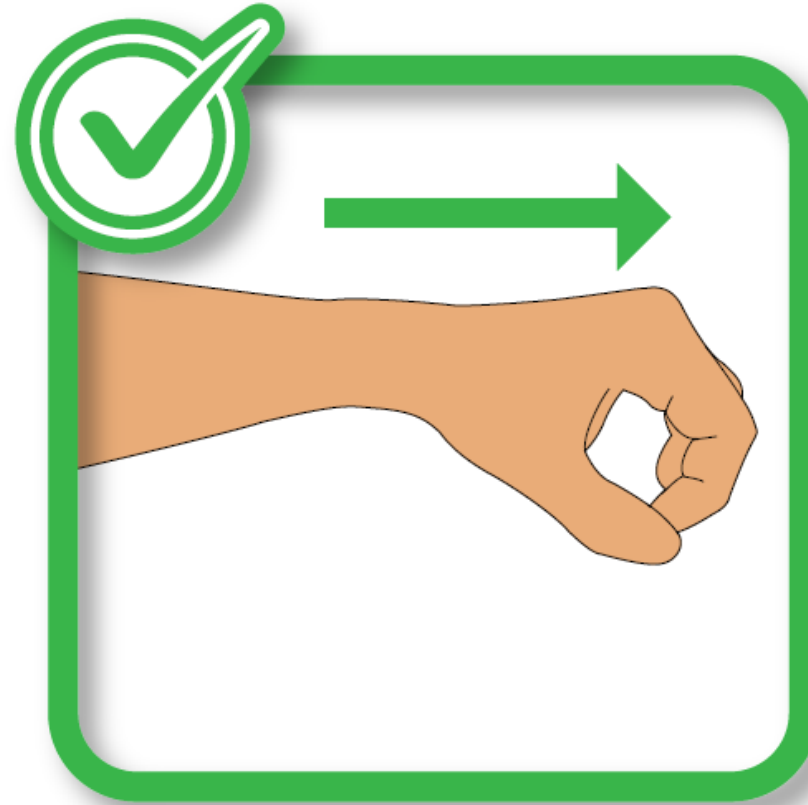
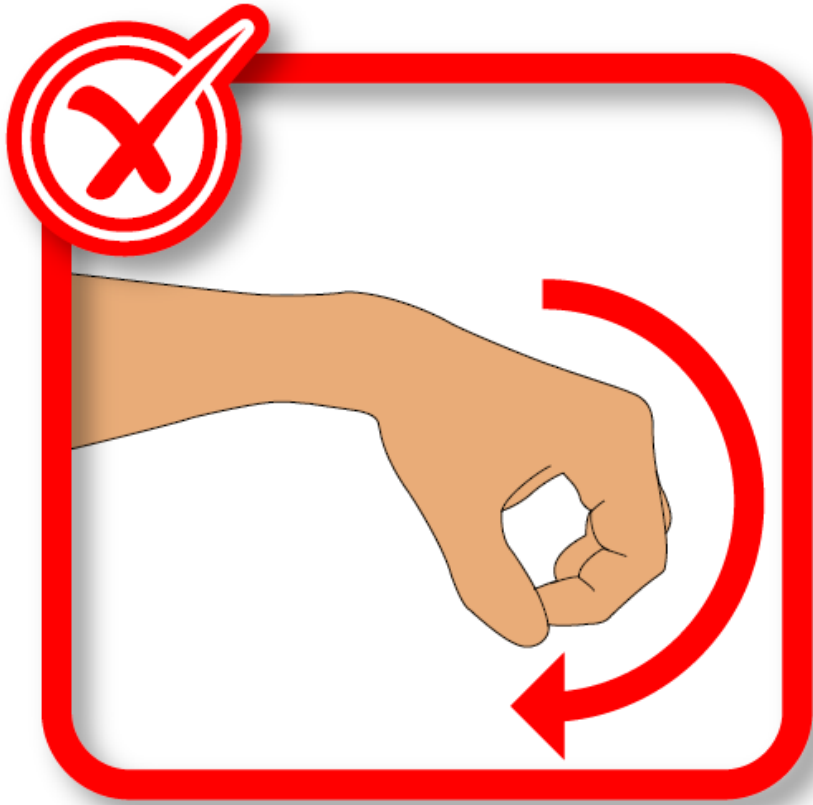


4. ELBOWS BY SIDES



Carrying objects close to the body reduces stress on the shoulders and back.

5. WRISTS STRAIGHT



Grip strength is much weaker when the wrist is bent thus, the body must work harder to have the same output.

Specific Application Discussions



Ensure to slide the object towards the body prior to lifting.

Specific Application Discussions



Train the Trainer

Driver Supervisor



Local Supervisors

- Learned Classroom Material
- Apply Learnings By Teaching

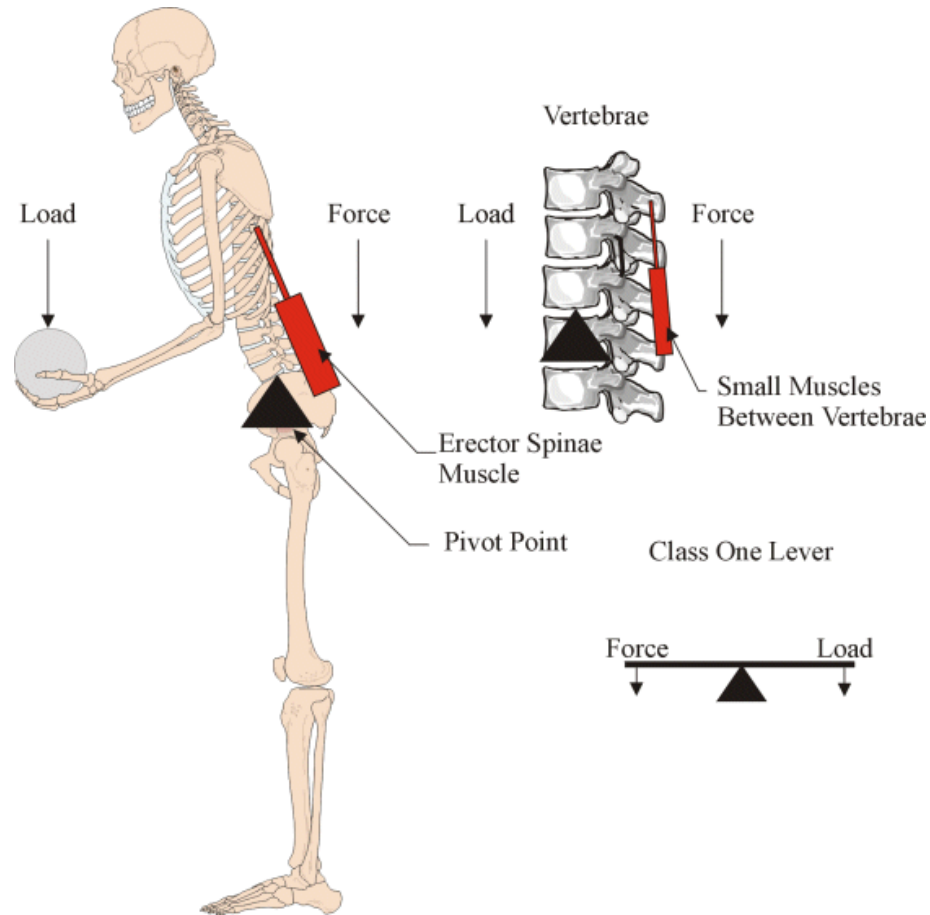
Safety Mgr.



Local Supervisors

- Learned Obstacle Course Material
- Apply Coaching Employees through Video Recording

“Train the Trainer” - Content



Erector Spinae serve as “bodyguards” for the spine.

Muscles can't protect the spine if fatigued.

Back Muscles are up against significant force based on the lever in the back favoring “balance” vs. force.

Picking up a 10lbs object creates shear forces of 1,150lbs. of force on the L4/L5 disks.



Do It

Live Obstacle Course (Drivers)





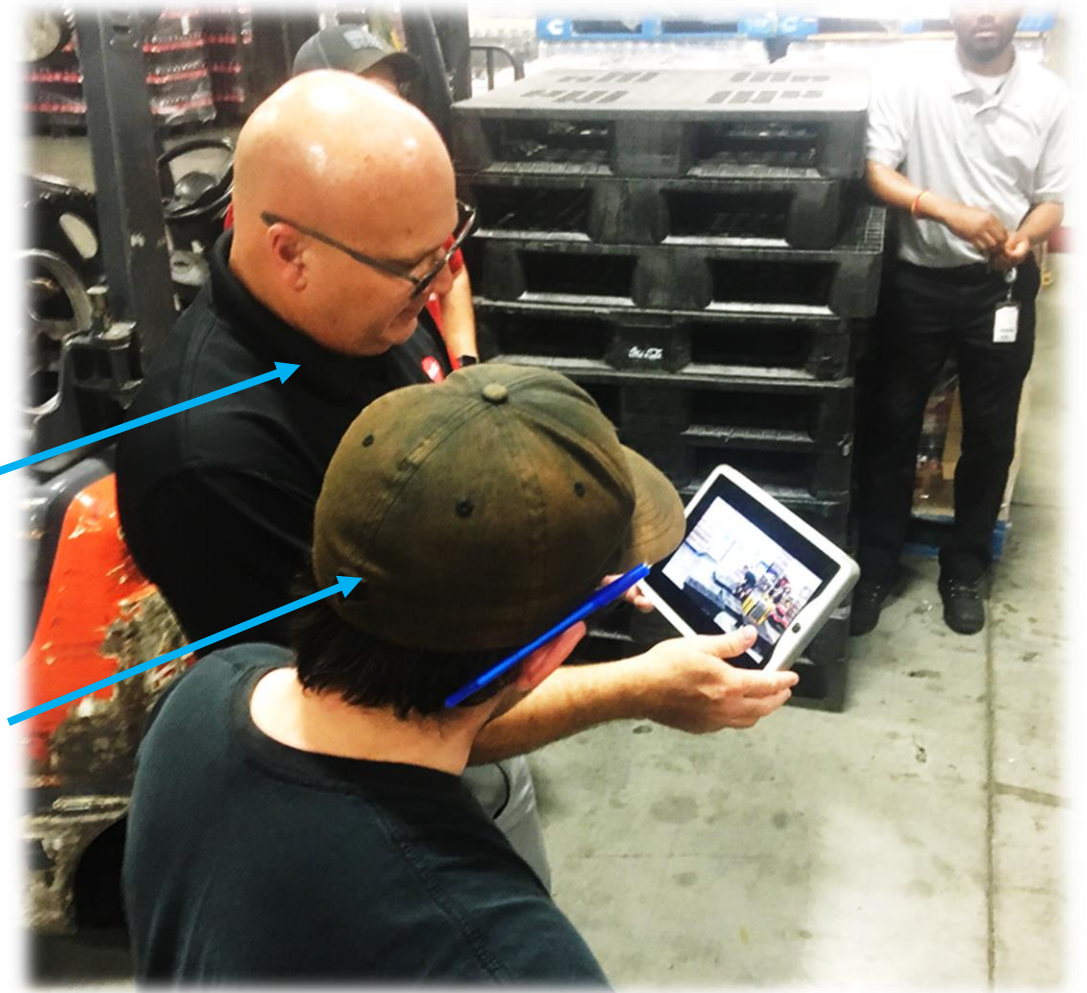
See It

Video Analysis



Local Supervisor

Driver



Safety Mgr.

Warehouse EE

Train-The-Trainer Certifications

Supervisors & Safety Managers



Jayne Welliver

Experience

- 25+ years of Safety Experience
- Construction/Maintenance, Manufacturing, Transportation
- Still learning!!

Responsibilities

- Communicating KBI and performance trends to MU Leaders
- Developing strategies to improve KBI performance
- Providing assessments, feedback, and actions for continual improvement in compliance and safety culture

Ohio Market Unit

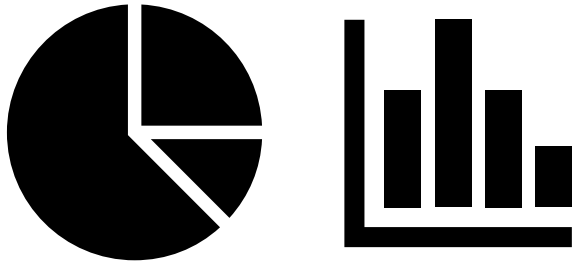
12 Distribution Centers



Behavior Change (Warehouse)



How we got here



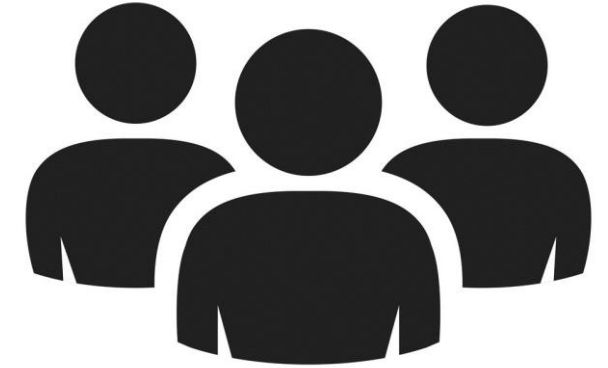
“Fish where the Fish Are”

- Strain/Sprains
- Delivery Drivers
- ?? Impactful



Pushing the Rock/ Doubts

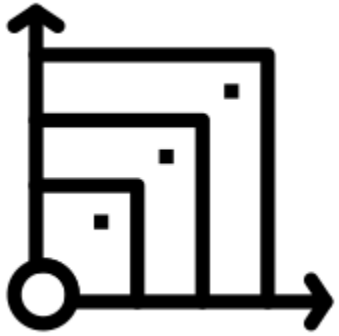
- OSHA
- Ergo Training
 - Too Technical



Content + Delivery

- Drives Improvement
- Adult Learning
- FUN!

Train the Trainer



Scalable

- Multiple Trainers
- Sustainable



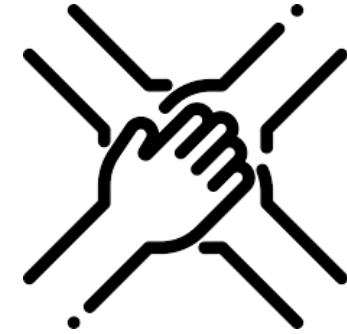
Informative

- Challenging
- Eye Opening



Empowering

- Soft Skills
- Leadership Growth



Team / Culture

- Inclusion
- Team Bonding Event
- Moral Booster



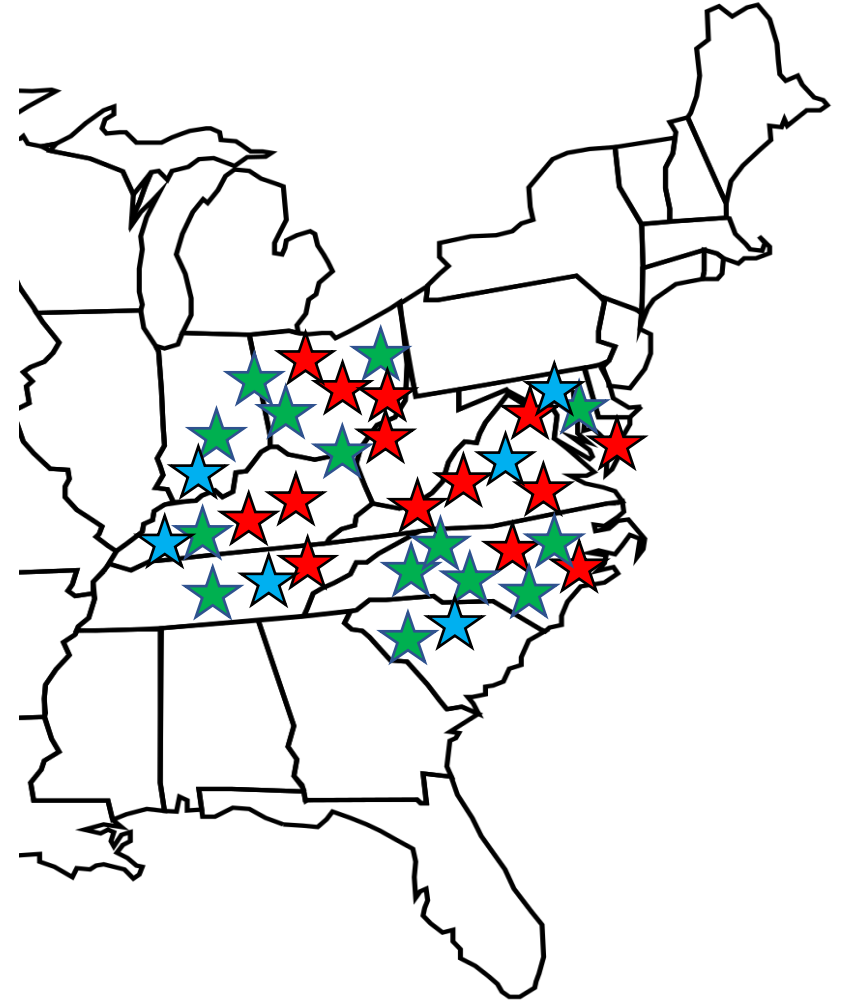
Driver Testimonial



Results

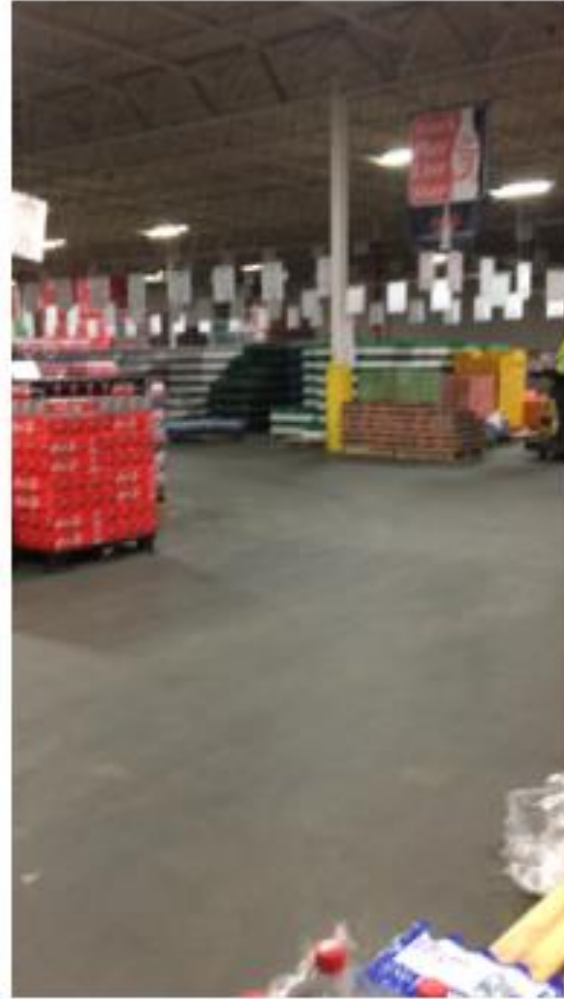
Ohio Market Unit
29% ↓ Ergo Injuries

Akron DC
60% ↓ Ergo Injuries
75% ↓ Claim Cost



★ Expansion Plan 2020 (13) ★ Bootcamp Completed (14) ★ Bootcamp Completed (7)

Behavior Change (Warehouse)



Key Take Away(s)

Information must be **applicable / customized** to gain acceptance

Let employees' coach you on their opportunities (soft coaching)
- Defensiveness **≠** Behavior Change

Make it FUN! Bring in a competition yet still drive the point.

Make it scalable. Training local resources is key.



Brock Anderson MS, CPE, LSSBB, CSCS
Owner & Principal Consultant

www.ergo-ology.com

404-804-6383



Jayne Welliver ASP
Safety & Loss Prevention Mgr.



| **ENHANCING LIVES. IMPROVING PRODUCTIVITY.**