

Teaching Them To Fish

Committee Based Ergonomics Process



Lakeside Manufacturing + R&R Insurance Services

Partners



- **70+ years Mfg. in WI**
- **Modifiable & custom mobile transport & storage carts for healthcare, food services & material handling**



- **Largest independently, family-owned insurance agencies in Midwest**
- **Celebrating 45 years in 2020**
- **Commercial, Benefits and Personnel Lines**
 - Client Industry support
 - Aligned Professional Services
 - Data driven decisions

How To Avoid Injuries

Goal:

- **Understand the anatomy, physiology and psychology of people and how they work**

Definition:

- **Fit the job to the person rather than making the person fit the job**

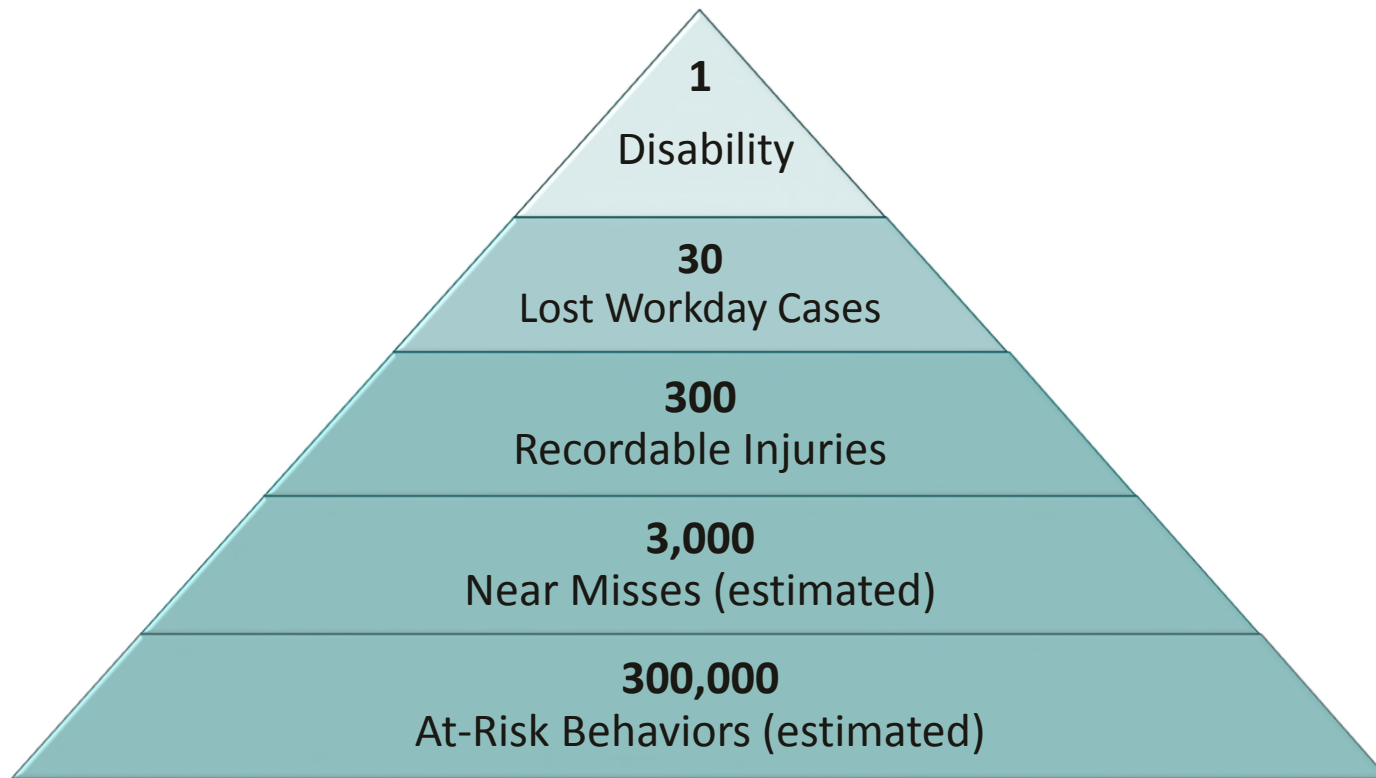
Lakeside Safety Committee Mission Statement:

- **To keep employees working safely and efficiently through ergonomics, procedures, and processes**

Human Factors



See the Risk, Change the Outcomes

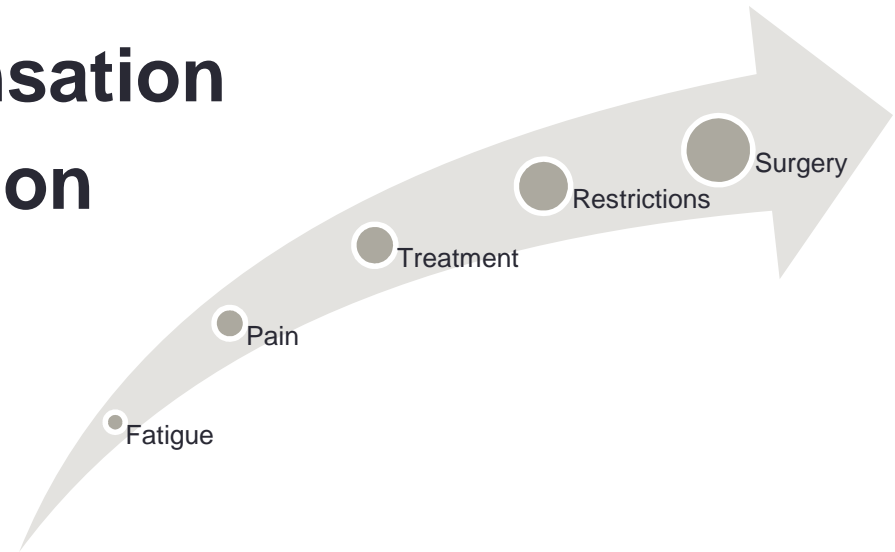


Actions = Injuries

Source: ConocoPhillips Marine study

Symptoms Progression

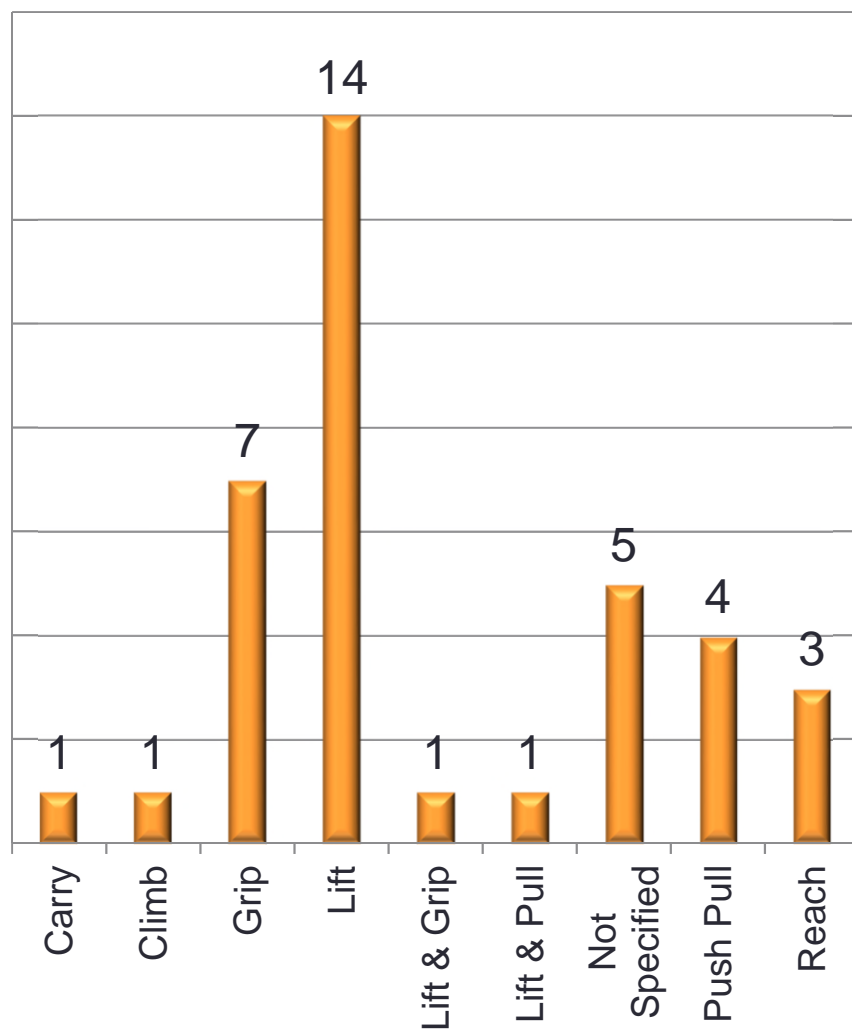
- **Fatigue, weakness**
- **Pain and discomfort**
- **Numbing, tingling sensation**
- **Limited range of motion**
- **Swelling**
- **Cold sensation**



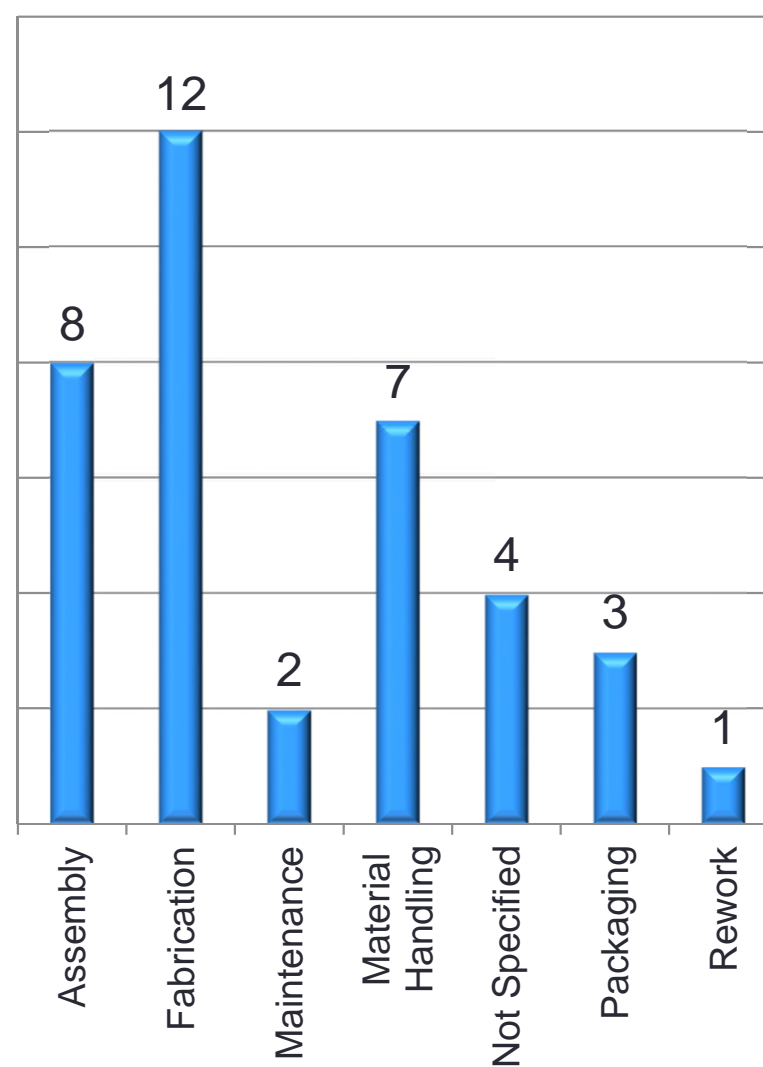
Addressed early, symptoms are reversible with ergonomic modifications

Musculoskeletal Injury Trends

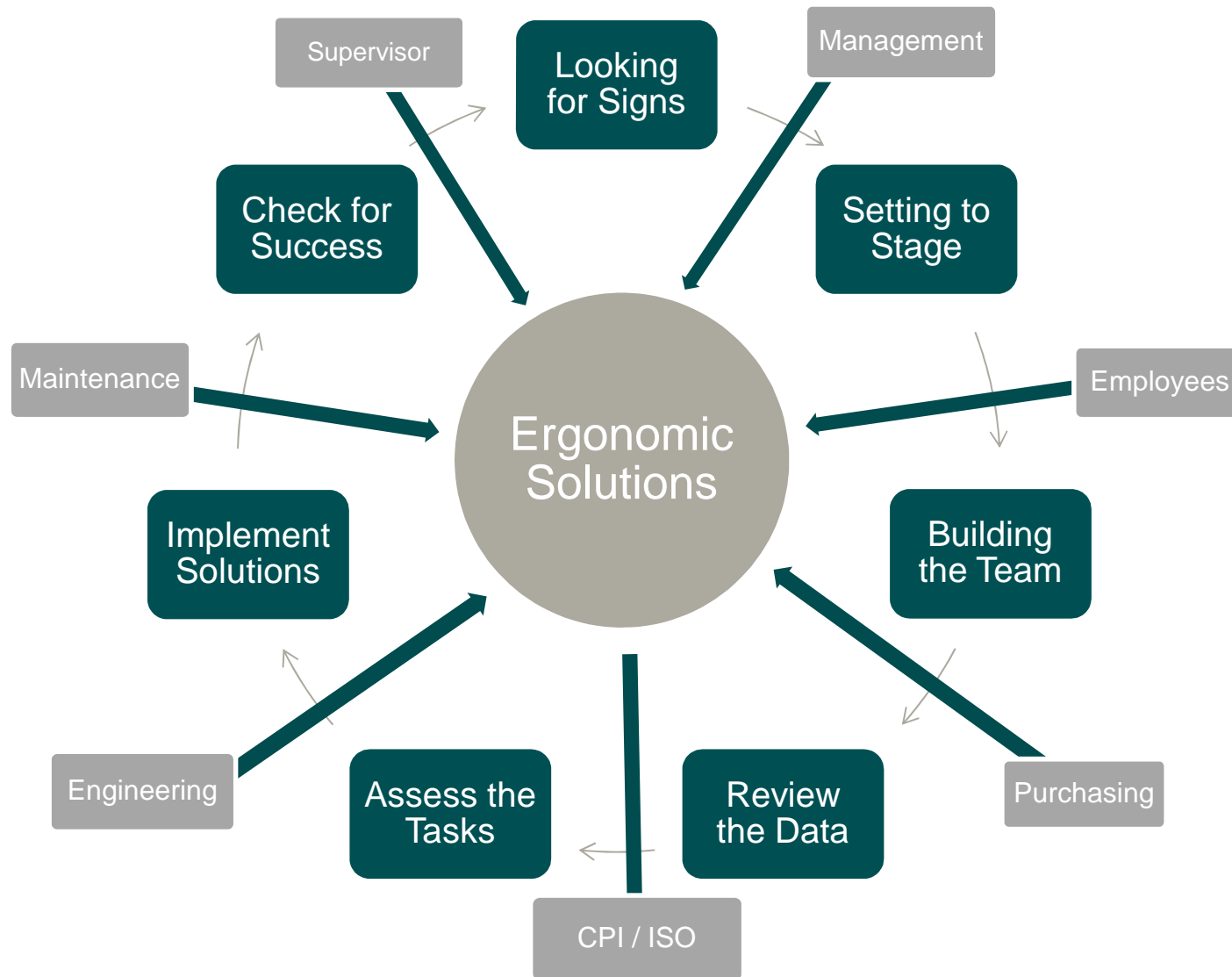
Mechanism of Injury



Process When Injury Occurred

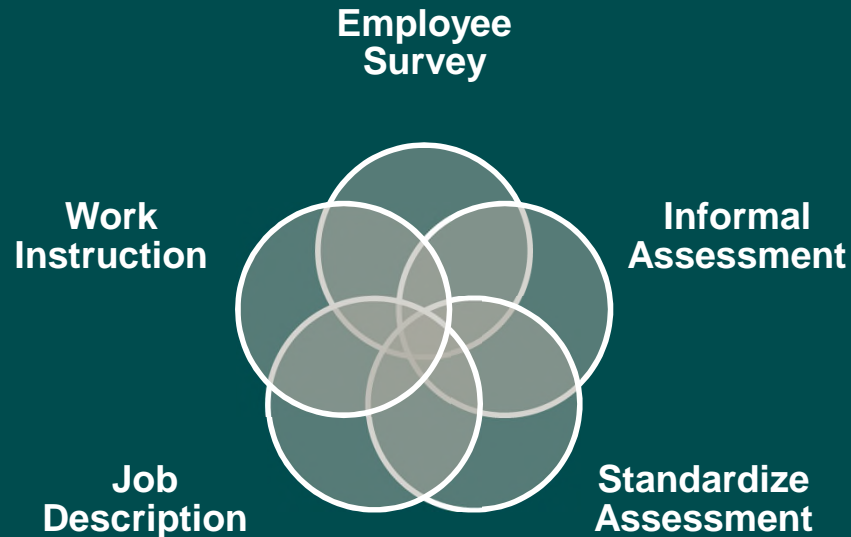


Looking For A Process Not A Written Program



Shift Safety Culture, Change Injury Outcomes, and Control Cost

Explored Proactive Actions




Engagement - Morale - Safety - Quality - Productivity

Standardize Ergonomic Assessment

WAC 296-62-05174 Appendix B: Criteria for analyzing and reducing WMSD hazards for employers who choose the Specific Performance Approach.

For each "caution zone job" find any physical risk factors that apply. If the conditions are present in the work activities. If they are, a WMSD hazard level or to the degree technologically and economically feasible performance approach).

| Awkward Posture | | |
|-----------------|---|---------------------------|
| Body Part | Physical Risk Factor | Duration |
| Shoulders | Working with the hand(s) above the head or the elbow(s) above the shoulder(s) | More than 4 total per day |

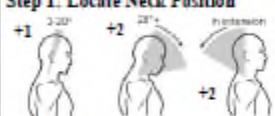
| HAZARD ZONE JOBS CHECKLIST | | | |
|--|--|--|---------------------------------|
| For each "caution zone job" find any physical risk factors that apply. If a hazard exists, it must be reduced below the hazard level or to the degree technologically and economically feasible. | | | |
| Movements or postures that are a regular and foreseeable part of the job, occurring more than <i>one day per week</i>, and more frequently than <i>one week per year</i>. | Hazard Exists <input checked="" type="checkbox"/> | Job Position evaluated: | No. of employees in these jobs? |
| | | Date: | |
| Awkward Posture | | Comments/Observations | |
|  | 1. Working with the hand(s) above the head, or the elbows above the shoulders | More than 4 hours total per day <input type="checkbox"/> | |

REBA Employee Assessment Worksheet

Based on Technical note: Rapid Entire Body Assessment (REBA), Hignett, McAtamney, Applied Ergonomics 31 (2000) 202-205

A. Neck, Trunk and Leg Analysis

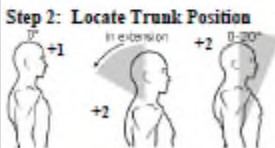
Step 1: Locate Neck Position



Step 1a: Adjust...
If neck is twisted: -1
If neck is side bending: +1

Neck Score:

Step 2: Locate Trunk Position



Trunk Posture Score:


SCORES

| Table A | | Neck | | | | | | | | | | | |
|---------------------|---|------|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | 2 | | | | 3 | | | |
| Legs | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Trunk Posture Score | 1 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 3 | 3 | 5 | 6 |
| | 2 | 2 | 3 | 4 | 5 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 |
| | 3 | 2 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 5 | 6 | 7 | 8 |
| | 4 | 3 | 5 | 6 | 7 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 |
| | 5 | 4 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 7 | 8 | 9 | 9 |

| Table B | | Lower Arm | | | | | |
|-----------------|---|-----------|---|---|---|---|---|
| | | 1 | | | 2 | | |
| Wrist | | 1 | 2 | 3 | 1 | 2 | 3 |
| Upper Arm Score | 1 | 1 | 2 | 2 | 1 | 2 | 3 |
| | 2 | 2 | 1 | 2 | 3 | 2 | 3 |
| | 3 | 3 | 3 | 4 | 5 | 4 | 5 |
| | 4 | 4 | 4 | 5 | 5 | 5 | 6 |

B. Arm and Wrist Analysis

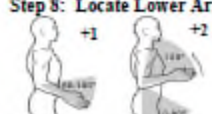
Step 7: Locate Upper Arm Position:



Step 7a: Adjust...
If shoulder is raised: +1
If upper arm is abducted: +1
If arm is supported or person is leaning: -1

Upper Arm Score:

Step 8: Locate Lower Arm Position:



Lower Arm Score:

Employee Survey

SYMPTOM RECOGNITION CHECKLIST

NAME: _____ DEPT/POSITION: _____
YEARS WITH COMPANY: _____ YEARS IN CURRENT POSITION: _____
DATE COMPLETED: _____

Check Area: No Symptoms Neck Shoulder Elbow/Forearm Hand/Wrist Fingers
 Upper back Low Back Thigh/Knee Low Leg Ankle/Foot

1.) Please put a check by the word(s) that best describe your problem.

1.) Aching 5.) Numbness(asleep) 9.) Tingling
 2.) Burning 6.) Pain 10.) Weakness
 3.) Cramping 7.) Swelling 11.) Other












2.) Have you had this problem in the past 12 months? _____

3.) When did you first experience this problem? _____

What do you feel are 3 work tasks that are potential of strains or sprains or safety problems?

What procedures would you recommend taking in order to help correct those ergonomic or safety concerns?

Informal Ergonomic Assessment

| ERGONOMIC HIT LIST EXPOSURE DEFINITIONS | | | |
|---|--|--|--|
|  <p>Butts Out Back Flexion - Forward Bend</p> <p>P > 20 degrees flexion D > 10 hrs R > 2x/week</p> |  <p>Twist And Shout Trunk Rotation - Twisting</p> <p>P > 20 degrees rotation R > 2x/week R > 4 hrs/shift</p> |  <p>High Five Shoulder & Arm Flexion - Reach</p> <p>P > 45 degrees, like shoulder, hand above head or elbow above shoulder D > 10 seconds R > 2x/week</p> |  <p>Chicken Wings Shoulder Abduction/Adduction - Arms Away From Body</p> <p>D > 10 hrs R > 2x/week</p> |
|  <p>Take A Squat Squat - Half or Full</p> <p>D > 30X of shift R > 2x/week</p> |  <p>Feels Like A Marathon Standing/Walking Concrete Floor</p> <p>Stepping off mat or on debris 300 min/shift interval</p> |  <p>Balancing Act Standing on 1 Leg</p> <p>D > 10 hrs R > 2x/week</p> |  <p>Sitting On A Dock Sitting Unsupported</p> <p>D > 2 hrs of one time D > 4 hrs/shift</p> |
|  <p>Hanging On For Your Life Hand Grip - Handle Diameter</p> <p>F < 1.5" or > 2.5" requires greater grip strength R > 2x/week D > 10 hrs</p> |  <p>Bobble Head Neck Lateral Rotation</p> <p>P > 20 degrees D > 10 hrs R > 2x/week R > 2 hours/shift</p> |  <p>Bowl Of Soup Elbow/Forearm Rotation P palm up, palm down</p> <p>F > 100 R > 2x/week</p> | <p>Other Ergo Exposure</p> |
| <p>P - posture - body position & movement, kinematical analysis using physics, physiology, anatomy F - force - variation in pressure dynamic biomechanics, i.e. lift, carry, push, pull R - repetition - frequency, equal time, rate of occurrence of task or motion D - duration - time of muscle contraction with static or dynamic activity</p> | | | |

Risk Factors



Posture (Awkward)



Force



Repetition (Frequency)



Duration

Butts Out



- Back Flexion
Forward Bend
- ✓ P >20 degrees flexion
 - ✓ D >10 sec
 - ✓ R >2x/min

Why is bending at the waist not good for the back?

Chicken Wings



Shoulder Abduction/Adduction
Arms Away From Body

- ✓ D > 10 sec
- ✓ R > 2x/min

Is this the right tool or work height for the task?

Feels Like a Marathon



Standing/Walking

- ✓ Concrete Floor
- ✓ Stepping off mat or on debris
- ✓ 300 mi/shoe insert

What are considerations for floor mats?
What can we learn from long distance runners?

Sitting On A Dock



- Sitting unsupported
Feet not touching floor
- ✓ D > 2 min at one time
 - ✓ D > 4 hr/shift

What occurs when sitting on a chair or stool where feet are not supported?

Hanging On For Your Life



- Hand Grip/Pinch Grip
Tool or Handle Diameter
- ✓ F <1.5" or >2.5"
requires greater grip strength
 - ✓ R >2x/min
 - ✓ D >10 sec

Does type of the tool really matter, what happens when gloves are used?

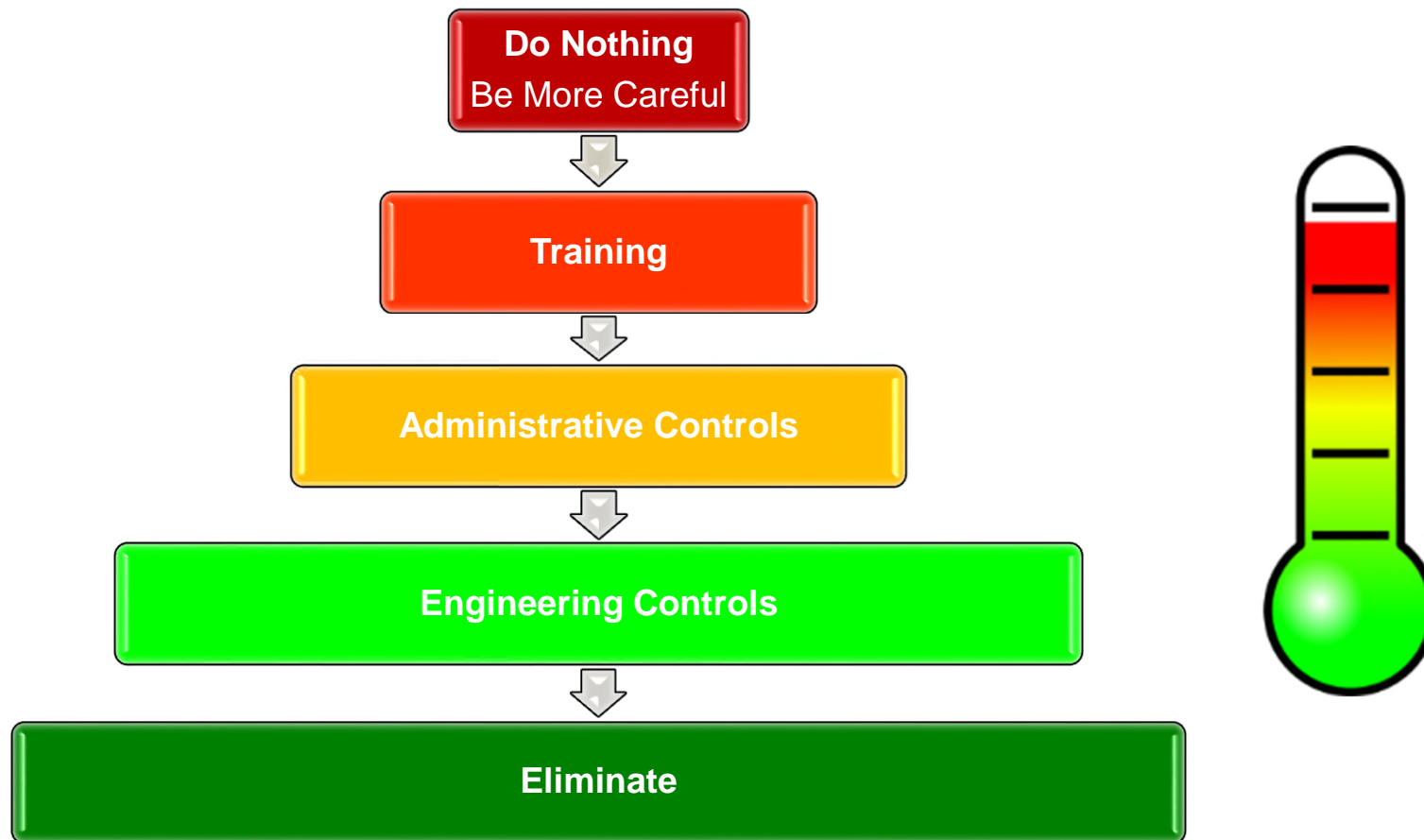
Bowl Of Soup



- Elbow/Forearm Rotation
- ✓ P palm up, palm down
 - ✓ F >10#
 - ✓ R >2x/min

Palm up, palm down, what task require a flip?
Are there repeated manual tasks?

Controls - Injury Prevention Hierarchy



Present Day Controls



Monthly Meeting Minutes

| Agenda Items: | Discussion | Recommended Actions | Status | Target Date |
|---|--|---|---|--|
| Discuss teams members' ideas | Review photos and/or written suggestions at each meeting. | Committee to review and submit to CI log as appropriate. | | (Monthly) |
| Equipment Recommendation for Planner 18 | Justin spoke to Zach, on board to add mats for the weld booths | 20 weld mats sourced and ready to order from Grainger. Ben will test a prototype homemade mat to see how/if it works for PL 18 weld booths. | David to follow up with Ellen from Grainger to get a sample | results ready for meeting in September |
| Evaluate Planner 31 for opportunities | Low welding fixtures | Add spacers or an adjustable base | Matt K working with Diann to submit maintenance WO | answer expected by Sept meeting |
| Evaluated deburring area in parts | Looking to acquire ergonomic tools - issue is \$ | Compare cost against a potential worker's comp. claim and added production value | Cost claim data received from R&R. Need to look into potential new tools (Tony). | ongoing |
| Lazer parts removal | Popping parts out all day causing strain throughout team members' arms | We have a few options to consider: 1. rotate users 2. thinner part tabs 3. test a pneumatic vibrator | 1. Parts team members are now rotating shifts 2. Shane to investigate plausibility 3. Tools are in house, might not be applicable | check progress in September meeting |
| Tube deburring issues | Looking to acquire ergonomic tools - issue is \$ | Compare cost against a potential worker's comp. claim and added production value | Laser tube cutter too expensive... still seeking alternatives. Matt will discuss ideas w/ Mike Z | ongoing |
| Hose reel for Central Pack | Air hoses pool on the ground and are a constant tripping hazard. | Submit a maintenance WO. | Maintenance WO submitted. | Waiting on status of WO. |
| Rose reel(s) for PL 18 | Air hoses pool on the ground and are a constant tripping hazard. | Submit a maintenance WO. | See if it works in Central Pack as a proof of concept. | Waiting on status of Central Pack WO. |
| Lift(s) for MLT countertops | MLT counters tops, especially the stone ones, can be very large, heavy, and awkward to lift. | Research options for new lifting equipment. | TBD based on further research. | ongoing |

Completed Items

| Agenda Items: | Discussion | Recommended Actions | Status | Completed |
|---|---|---|-----------------------------------|-----------|
| Equipment Rec for Planner 18 | Justin spoke to Zach, on board for potentially adding 2-3 lifts | Use Planner 18 dedicated forklift with adjusted stabilizers instead of buying a new lift. | Forklift adjusted by Maintenance | 2/20/2019 |
| Equipment Rec for Planner 18 | Carts needed additional support when lifted. | Add riser bumpers to forks to stabilize and protect carts. | Built by Maintenance | 2/20/2019 |
| Evaluate Planner 31 for opportunities | Rivet machine isn't bolted down | Bolt down | Completed by Maintenance | 6/1/2019 |
| Evaluate Planner 31 for opportunities | Tools not in reach | Further observation needed to determine plan of attack. | Verified to be a non-issue. | 6/26/2019 |
| Evaluate Planner 31 for opportunities | Adjustable height table not in working order | Diann to submit a maintenance WO | WO completed | 7/24/2019 |
| Replace Justin S. | Want to replace Justin with another team member from the floor | Recommend Dan H, Gabe M, or Ben M | Ben M joined the team | 7/24/2019 |
| Large step stool/platform for PL 52 table | Table is built to accommodate taller team members. Need to have a step stool or platform for shorter team members to use the table. | Determine appropriate design, compare cost of buying vs fabricating a solution, and then purchase or build accordingly. | Made our own platform, works well | 7/8/2019 |

Handouts

Ergonomic Resources By Industry & Assessment Tools



Ergonomic Resources by Industry
October 2018
Maureen Joy 262-953-7020

Professional Services

Ergonomic Guidelines for Manual Handling
<https://www.cdc.gov/niosh/docs/2007-131/pdfs/2007-131.pdf>

Manufacturing Industry

Material handling Industrial Ergonomics Backgrounder - MHI.org
www.mhi.org/downloads/industrygroups/ease/.../ERGOBACKGROUNDDOC.pdf

Selecting non power hand tools – CDC.gov
<https://www.cdc.gov/niosh/docs/2004-164/pdfs/2004-164.pdf>

Offices and Computer Workstations

OSHA Computer Workstation Ergonomics eTool – osha.gov
<https://www.osha.gov/SLTC/etools/computerworkstations/index.html>

Office Ergonomics Interactive Guide – wa.gov
http://www.lni.wa.gov/safety/trainingprevention/online/courseinfo.asp?P_ID=184

Ergonomics Guidelines for Arranging a Computer Workstation – cornell.edu
<http://ergo.human.cornell.edu/ergoguide.html>

Office Ergonomics Resources- ergo plus
<https://ergo-plus.com/office-ergonomics-guide/>

Pharmaceuticals

Ergonomics in the Pharmaceutical Industry – HSE.gov.uk
<http://www.hse.gov.uk/pharmaceuticals/index.htm>

Printing Industry

Printing Industry OSHA eTool – osha.gov
<https://www.osha.gov/SLTC/etools/printing/index.html>

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Ergonomic Assessment Tools
October 2018
Maureen Joy 262-953-7020

Professional Services

ART (The Assessment of Repetitive Tasks) Health and Safety Executive
www.hse.gov.uk
Repetitive Tasks, Upper Extremity impacted by frequency, force, awkward postures, breaks, work pace, gloves, vibration, tools, fine motor (finger), cold environment, lighting

Brief Survey (Human Tech)
www.humantech.com fee required
Total Body, awkward posture, force, duration, frequency, physical stressors – vibration, contact stress, lighting, and temperature

Caution & Hazard Zones Checklists Dept of Labor and Industries Washington State
www.indi.wa.gov
Awkward postures, high hand force, high repetitive motion, related impact, lifting – heavy, frequent, awkward and mod-high hand vibration

HAL/TLV (Hand Activity Level Threshold Limit Value)
<http://personal.health.usf.edu/tbernard/HollowHills/HALTLVM15.pdf>
Upper extremity for mono task processes rate hand activity and peak force

Liberty Mutual Manual Material Handling Tables (Stover Snook Tables)
www.libertymutual.com
Lifting, lowering, pushing, pulling, all consider male and female separately

MAC (Manual Handling Assessment Tables)
www.hse.gov.uk
Lifting, carrying and team lifts

MFA (Rogers Muscle Fatigue Analysis)
http://personal.health.usf.edu/tbernard/HollowHills/Rogers_MFA_M20.pdf
Total Body, rate muscle fatigue with posture, duration and frequency

MSI Risk Factor Id (Work Safe BC)
www.worksafebc.com

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Questions

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