Four Steps to Deploying Your Ergonomics Process

By
Winnie Ip, B.Sc., MBA, CPE
Walt Rostyokus, CPE, CSP, CIH
About Humantech

Humantech was founded with the single focus of improving the lives of the working population. Over the past 35+ years, our approach has changed how organizations use the science of ergonomics to improve workplace performance.

We’re experts in workplace improvement. Big project or small, we bring tangible benefits to you and your company at every step. Whether you need to deploy a global ergonomics initiative or a single risk assessment, we partner with you to achieve your goals. We listen well, work hard, and evaluate ourselves based upon your success.

We are the largest consulting team of Board Certified Professional Ergonomists in North America. Humantech consultants combine expertise in ergonomics with practical industry experience and the skills of professional services delivery.

Our software solutions help you take control of your ergonomics process. Humantech’s proprietary assessment and solution tools, e-learning, and central online system give you a faster, more effective and efficient way to manage ergonomics corporate-wide.

A team of highly qualified professionals with skills in e-learning and software development, industrial and graphic design, sustainability, and information technology supports our consulting staff.
Find and fix your high-risk jobs quickly with our experts at your side.

The Humantech System® is an all-in-one solution for managing workplace ergonomics in industrial environments.

NEW for 2016!

These features make The Humantech System more accessible than ever before:

- Wide-screen layout
- Advanced assessment tools
- Job rotation module
- More languages
- Videos and product reviews
- Projected analysis tool

Learn

Online Training

Build knowledge quickly. Access 7 interactive online training modules covering everything from principles of ergonomics to design guidelines. You choose which modules are appropriate for your teams.

Do

The Job Improvement Process

Gain skills to assess and fix jobs. Once the online training is finished, your teams will work alongside our Certified Professional Ergonomists to assess and improve problem jobs.

Manage

Data and Reporting

Verify and track progress. With The Humantech System, ergonomics process owners can easily monitor the activities of the ergonomics team, track the status of improvement plans, and generate reports.

Learn more at www.humantech.com/thesystem

Copyright 2016 Humantech, Inc.
About the authors

**Winnie Ip, B.Sc., MBA, CPE**

Winnie Ip, Vice President and Ergonomics Engineer for Humantech, has experience implementing, delivering, and managing complex, large-scale ergonomics programs in a variety of industries, from automotive to petroleum to food and beverage and printing industries.

Winnie partners with top management of Fortune 1000 companies to provide direction and strategies for improvement. She helps companies establish and sustain their ergonomics management programs, provides technical services, delivers high impact training, and conducts process reviews.

Winnie received a Bachelor of Science degree in Kinesiology from the University of Waterloo in Waterloo, Ontario. She also completed a Master of Business Administration degree at the Richard Ivey School of Business, University of Western Ontario, in London, Ontario. Winnie has achieved recognition as a Certified Professional Ergonomist (CPE) and is a member of the American Society of Safety Engineers (ASSE).

Currently, Winnie serves on the Volunteer Advisory Committee of the ASSE Ergonomics Practice Specialty as the Webinars and PDC Coordinator.

**Walt Rostykus, CPE, CSP, CIH**

Walt Rostykus, Principal Consultant and Ergonomics Engineer for Humantech, has over 30 years of experience delivering and managing ergonomic, occupational safety, industrial hygiene, and environmental programs. He has provided technical services, established management programs, and conducted process and compliance reviews of ergonomics programs and health and safety programs in a wide variety of industries.

Walt received a Bachelor of Science degree from Washington State University in Pullman, Washington. He earned a Master of Science degree in Public Health, with a focus on Industrial Hygiene and Safety/Environmental Health and Sanitation, from the University of Washington, in Seattle, Washington. He is a Certified Professional Ergonomist (CPE), a Certified Safety Professional (CSP), a Certified Industrial Hygienist (CIH), and has served as an Environmental Management System Lead Auditor. Walt is currently the Administrator of ASSE’s Ergonomics Practice Specialty.
Contents

About this Book ..................................................................................................2

Introduction.........................................................................................................3

Four Steps to Deploying Your Ergonomics Process

#1 – Prepare People for Success .................................................................5

#2 – Provide the Right Tools and Resources ...........................................7

#3 – Apply the Job Improvement Process .................................................10

#4 – Track Your Progress............................................................................12

Final Thoughts... ..........................................................................................14

Additional Resources.....................................................................................14
About this Book

This e-book is the fourth in a five-part series exploring Humantech’s Engagement Model. It was created to help you implement a new ergonomic improvement process, restart one that has fizzled, or improve an existing one. Throughout the series, we will share key points we’ve learned from our experience assisting organizations worldwide. We hope this information will help you succeed.

The Engagement Model we use is simple, yet proven and effective. It looks like this:

1. **Gaps & Fit**
2. **Foundation**
3. **Leadership**
4. **Deployment**
5. **Review**

The previous three e-books in this series provided best practices for preparing (**Gaps & Fit**), designing (**Foundation**), and getting commitment for an ergonomic improvement process (**Leadership**); they covered the planning phases, or “ready, aim.” This e-book addresses the doing phase, or “fire!” Here we share the best practices we’ve identified for launching and establishing an effective, integrated, and sustainable process to systematically find and control the risk factors that cause musculoskeletal disorders (MSDs) in the workplace.

We invite your comments, questions, and reactions to this e-book on our blog, The 30-Inch View. And if you enjoy what you read, please feel free to share it with colleagues and co-workers.
Introduction

To improve ergonomic conditions in the workplace and reduce MSD injuries, you must take action. That action, for the existing workplace, typically includes identifying jobs and tasks in which people are exposed to high levels of MSD risk factors, making changes to reduce those exposures, and then verifying that the risk has been reduced to an acceptable level. These steps are known as the job improvement process and are typically carried out by subject matter experts (SMEs) who have been trained to use assessment and design tools to lead risk reduction efforts. SMEs can range from employee representatives on safety and ergonomics teams, to people qualified in ergonomics, to engineers.

In addition to improving the existing workplace, the job improvement process must address the quality (ergonomic fit) of new and modified equipment, tools, layout, and jobs. This is typically the responsibility of process and production engineers, space planners (for office workplace design), and product designers.

Starting and sustaining these actions is what the Deployment step in the Engagement Model is all about.

Deployment

This is the step in which your ergonomic improvement process is launched and begins to systematically find, fix, check, and sustain the reduction of MSD risk factors (i.e., apply the job improvement process). However, this is not the starting point. As mentioned in the previous e-books, successful organizations take the time to plan and design the foundation elements of their ergonomic improvement process, and get commitment and endorsement from leaders, before launching. These were the “ready, aim…” steps, and now you are ready to “fire.” Deployment is the “fire” step during which the people supporting your ergonomic improvement process

- develop their skills and knowledge;
- apply the job improvement process in the current workplace;
- ensure MSD risk is reduced in new tools, equipment, and layouts;
- track and report the MSD risk reduction measures to leadership;
- share effective solutions for reducing MSD risk; and
- communicate progress and results to the organization.
There are a lot of steps within Deployment, highlighted in the plan example below. Yours may vary, but consider the four core steps that follow to ensure success.

<table>
<thead>
<tr>
<th>Description of Activity</th>
<th>Owner</th>
<th>Scheduled Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present policy &amp; plan to site management</td>
<td>Bob</td>
<td>X</td>
</tr>
<tr>
<td>Identify management sponsor</td>
<td>Bob</td>
<td>X</td>
</tr>
<tr>
<td>Add ergonomic measures to business metrics</td>
<td>Sue</td>
<td>X</td>
</tr>
<tr>
<td>Recruit support</td>
<td>Bob</td>
<td>X</td>
</tr>
<tr>
<td>Train Ergo. Team</td>
<td>Bob</td>
<td>X X</td>
</tr>
<tr>
<td>Train for engineers</td>
<td>Bob</td>
<td>X X</td>
</tr>
<tr>
<td>Train managers</td>
<td>Harry</td>
<td>X X</td>
</tr>
<tr>
<td>Train employees</td>
<td>Harry</td>
<td>X X</td>
</tr>
<tr>
<td>Conduct risk assessments</td>
<td>Bob</td>
<td>X X</td>
</tr>
<tr>
<td>Implement changes</td>
<td>Bob</td>
<td>X X</td>
</tr>
<tr>
<td>Verify risk reduction</td>
<td>Bob</td>
<td></td>
</tr>
<tr>
<td>Communicate results</td>
<td>Bob/AI</td>
<td>X X X</td>
</tr>
</tbody>
</table>

Deployment Plan Example
Prepare People for Success

The ergonomic improvement process for your organization should involve many employees in many different roles. These roles were described in the e-book on Foundation and included a sponsor, ergonomics process lead, SMEs (ergonomics or safety team members), engineers, supervisors and managers, employees, and more. The importance of commitment by top management to provide and support people in these roles was discussed in the prior e-book on Leadership. To ensure that each person involved in ergonomics is successful in their role, they must be prepared.

Preparation of key participants includes ensuring that they understand all aspects of the ergonomic improvement process, understand the common goal and tracking measures established, know their roles and the actions expected of them, are familiar with the roles of other support people with whom they may interact, are able to perform their activities correctly and consistently, and have the time available to perform these activities.

This is where training comes in. Most people serving as ergonomics team members, engineers, and ergonomics process leads do not come into the role with formal education or experience in ergonomics. Don’t be lured into a generic “ergonomics training” program because, unfortunately, there is no single training course that is appropriate for all. Training for ergonomics must be designed to meet the learning objectives for a specific role, and these should align with the specific roles and responsibilities of the audience. The different levels of responsibilities (and learning objectives) are outlined in the Foundation e-book. At a high level, training in ergonomics can be organized into two categories: skills and awareness.

Skills training provides your “resident experts” (SMEs, engineers, and product designers) with the advanced knowledge, skills, capabilities, and confidence to conduct MSD risk assessments, apply ergonomic design guidelines to tools and equipment, lead improvement projects, or lead the ergonomics process—in other words, to complete the job improvement process.
Awareness training, on the other hand, provides general knowledge about the ergonomic improvement process for managers, supervisors, and employees. It gives them simple tools with which to identify potential MSD risk and make workstation adjustments to control the risks.

<table>
<thead>
<tr>
<th>Role</th>
<th>Learning Objectives</th>
<th>Awareness</th>
<th>Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Sponsor</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Ergonomics Process Lead</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Subject Matter Expert</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Engineers &amp; Maintenance</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Managers &amp; Supervisors</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Employees</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Medical/Workers’ Comp.</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Site Safety Staff</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Product Designers</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Training Matrix Example

Not only do your ergonomics support people need to know their roles and expectations, their direct managers must know and agree to those roles, the actions expected, and the time commitment for each person. This ensures that these key people are available to conduct assessments or lead improvements.

Because managers and supervisors are responsible for managing performance, they should include the expectations and performance of SMEs, engineers, and others supporting the ergonomic improvement process in performance evaluations. This step enforces accountability for performance, and ensures that people are recognized for their contributions to the process.
Provide the Right Tools and Resources

There are many MSD risk assessment tools and ergonomic design guidelines available. They include qualitative and quantitative methods, for both the entire body and specific body segments, and they come in digital and hardcopy form. So where to start?

Tools for an ergonomics process fall into two general categories: risk assessment tools for determining if the workplace fits the person, and solution or design guidelines to determine the best design to fit the employee. Regardless of which tools you choose to use, remember that they should be

- few in number (2 to 6 for your support people);
- able to quantitatively measure exposure to MSD risk factors;
- easy to use, complete, and collate the data collected;
- based on valid, current research that is repeatable and reliable;
- backed up with training for the users and selected to fit the exposures in your workplace; and
- common tools used by all throughout your organization.

Using common tools is critical to having common measures (measuring things the same way). The last thing you want is to have different people using different assessment methods and different guides to design workstations.
Risk Assessment Tools

In our experience, you need only five common tools in your MSD risk assessment toolbox to evaluate the majority of tasks:

<table>
<thead>
<tr>
<th>Tool</th>
<th>Body Segment(s)</th>
<th>Used By</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole-Body Qualitative Checklist</td>
<td>Both hands/wrists, elbows, shoulders, neck, back, and legs</td>
<td>All employees</td>
<td>Office and non-office</td>
</tr>
<tr>
<td>Whole-Body Quantitative Assessment</td>
<td>Both hands/wrists, elbows, shoulders, neck, back, and legs</td>
<td>SMEs</td>
<td>Non-office</td>
</tr>
<tr>
<td>Lifting Assessment</td>
<td>Back</td>
<td>SMEs</td>
<td>Manual lifting</td>
</tr>
<tr>
<td>Pushing, Pulling, Carrying Assessment</td>
<td>Back and arms</td>
<td>SMEs</td>
<td>Pushing, pulling, and carrying</td>
</tr>
<tr>
<td>Office Workstation Assessment</td>
<td>Both hands/wrists, elbows, and shoulders, neck, back, legs</td>
<td>Employees working in office and on computers</td>
<td>Office and computer use</td>
</tr>
</tbody>
</table>

SMEs will need some additional measurement devices to collect data when using quantitative assessment tools, like tape measures, force gauges (push/pull), video cameras, and a data recording devices (clipboard and paper forms or tablet for electronic forms).

Occasionally, you may require other, more specialized assessments, for example, when measuring exposure to vibration, cardiac loading, or more finite hand motions. These specialized assessments can be completed by a qualified ergonomist, supplementing those assessments completed by SMEs.

The results of MSD risk assessments should produce a quantified measure or score of exposure based on objective criteria; this is your measure of MSD risk. It is similar to measuring exposure to the intensity and duration of noise levels to determine the risk of hearing loss and comparing the results to a threshold in order to determine the level of exposure.

The results of MSD risk assessments must be documented and collated to determine the degree of MSD exposure and, after improvements are put in place, risk reduction. These exposure measures feed into the ergonomic improvement measures discussed in the Foundation and Leadership e-books.
Design Guidelines

Ergonomic design guidelines are the dimensions, forces, and measurements that help us design or modify jobs, tools, and equipment to fit the capabilities of people. Design guidelines are essential for ensuring that job improvements reduce the level of MSD risk, and that new equipment and tools do not introduce new exposures. Because the guidelines will be used by SMEs, engineers, and product design engineers, it is best to have a common set of design criteria for use by all.

The types and number of design criteria in your library will depend on the range of employee working conditions. For example, design criteria for an office are limited to working with a keyboard, mouse, monitor, and writing surface in a seated or standing position. In addition, lighting and noise criteria may be helpful. The criteria will enable facilities and space planners and IT (engineers of the office workplace) to select and design workstations to adjust and fit most people. In delivery and warehousing tasks, the key design criteria are for lifting and manual handling, pushing and pulling loads and, for drivers, vehicle design. And in manufacturing and laboratory operations, design guidelines will range from hand tool, force, and weight guidelines, to workstation dimensions, weight and size of materials lifted, and more.

Finally, determine the general body (anthropometry) types of your employee population. There are general differences in working heights, reaches, and hand sizes among people of different ethnic groups; use the design guidelines that match the employees in your organization. We have found that the five most common body types in today’s global workplace are U.S./Canadian, Mexican, Latin American, European, and Asian.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Working Height of Comfort Zone Bottom</td>
<td>Minimum 24”</td>
</tr>
<tr>
<td>B. Working Height of Comfort Zone Top</td>
<td>Maximum 62”</td>
</tr>
<tr>
<td>C. Hand Working Height Optimal Comfort Zone Bottom</td>
<td>Minimum 38”</td>
</tr>
<tr>
<td>D. Hand Working Height Optimal Comfort Zone Top</td>
<td>Maximum 49”</td>
</tr>
</tbody>
</table>
Apply the Job Improvement Process

Ergonomics does not improve, and MSD risks are not reduced, without change to the workplace. This step is critical, yet often overlooked.

The job improvement process involves four simple steps, typically performed by SMEs and engineers:

- **Find It (Plan)**
  - Conduct MSD risk assessments to screen for, measure, and identify job tasks that have exposures above an acceptable level.
  - Prioritize the jobs to determine which will be improved.
  - Develop plans for reducing the MSD risk level in each selected job.

- **Fix It (Do)**
  - Form a cross-functional team of employees who perform the job, key engineering and maintenance personnel, and area management to assist in identifying and selecting workplace changes.
  - Make changes to the equipment, tools, and job design that reduce the MSD risks identified.

- **Check It (Check)**
  - Conduct a follow-up assessment to determine change in risk level.
  - Compare the before MSD risk score with the after risk score for an immediate determination of how effective the workplace change was in reducing MSD risk, and if risk was reduced to an acceptable level.

- **Sustain It (Act)**
  - Make sure the effective workplace changes are sustained (critical for the first three to four weeks when people may want to “put things back the way they were”). Update work instructions, procedures, and training to include the new improvement.
  - If you’ve identified a workplace change that reduced MSD risk, duplicate the improvement at other workstations across the room, building, business unit, and organization.
A couple of best practices are:

- **Engage operators in the Fix It step** through brainstorming sessions and testing improvements because they are the experts of the total task; they may have ideas or solutions and can identify potential challenges or constraints with solutions. Including them in workplace improvement reduces resistance and increases uptake, acceptance, and use of the solution.

- When selecting improvements, always pursue engineering controls first. This is the preferred control in the hierarchy of controls for safety hazards, and has been proven to be effective in ergonomics. A study by Goggins, et al. (2008) demonstrated the cost effectiveness of controls for MSD risk reduction. This study is useful information when dealing with push-back on the cost of changing a workstation or installing a lift, when management asks, “Can’t we just rotate people or train them? It won’t cost as much…” This study validates the hierarchy of controls for ergonomics.

![Diagram showing the hierarchy of controls with reduced exposure](image-url)
Track Your Progress

Making your progress visible is critical for sustaining it over time and for gaining ongoing buy-in and momentum. During benchmarking studies, we heard that even well-planned ergonomics programs fizzle and fade because people do not see or hear about them. The lesson here is to communicate, demonstrate value, communicate, show progress, communicate, and keep it visible. This means regular tracking and communication at two levels: individual workstation improvements and organization-wide improvements.

The results of changes to individual workstations can be measured immediately by a follow-up assessment, and then illustrated by showing the before and after risk scores. This visually communicates to employees that leaders support the job improvement process and that risk levels are being reduced. It also communicates the risk reduction to leaders (who fund the improvements) and verifies that improvement goals are on track. The simple but powerful before/after comparisons can easily be shared on bulletin boards, internal TVs, in newsletters, and at staff meetings.

Organization-wide improvements can be tracked and monitored through the ergonomics process measures and goals established by leaders (see Leadership e-book). When they are integrated into the regular business dashboard and review process (e.g., quality, production, profit), the importance of ergonomics is elevated and shown to be important to, and endorsed by, leaders. The risk reduction metrics are a common and consistent means for communicating the goal and progress of the ergonomic improvement process. The MSD risk level scores determined from assessments are easily collected electronically and are scalable for reporting at different levels; that is, they can be used to track the performance of the entire organization, a department, or even the jobs for which a single manager or supervisor is responsible. Reporting at several levels shows managers their contribution to the overall goal, and provides an early warning system of where an MSD may occur so they can take preventive action.
A wise person once said, “What interests my manager, motivates me.” This is true for any aspect of business. If your CEO or plant manager is seen and heard asking about MSD risk reduction measures and presenting case studies of job improvements at company meetings, they are sending a clear message that improving ergonomics is important to them and expected of their direct reports. This interest trickles down through the organization and becomes a regular part of daily operation and improvement.
Final Thoughts

Deploying and managing an ergonomic improvement process creates a large amount of data, documents, and records that must be available to a wide range of people. These could include plans for completing assessments and improvements, copies of common design guidelines, and the results of follow-up assessments to measure MSD risk reduction. Managing all of this data—collating and providing information real-time to many people—can create an administrative nightmare. Fortunately, today there are software tools designed specifically for managing the ergonomic and job improvement processes. These software solutions include online training and management tools, electronic tools for recording assessments and solutions, methods for planning and tracking completion of improvements, and sorting and collating data into real-time reports.

Additional Resources


