



THE ULTIMATE GUIDE TO MSD PREVENTION





WHY PREVENTION?

Preventing injuries at work is simply the right thing to do. Every safety manager, supervisor, CEO and every other member of your team deserves it – and must strive to make it happen every single day.

Your health and safety program is probably doing pretty well. You are OSHA compliant, the proper safety signage hangs on the walls, the best PPE gear is worn, and everyone goes home to their families after work. In general, your workplace is fairly safe.

But do your employees ever complain about fatigue? Discomfort? Pain? Do you have costly OSHA recordable injuries on a regular basis? Safety managers and supervisors can easily be overwhelmed. It's a big job and the clock seems to move at the speed of light. Sound familiar?

MSDs are Common and Costly

Musculoskeletal Disorders (MSDs) are a common and costly problem for companies across the United States. Here are some commonly cited statistics about the MSD problem for companies:

- MSDs cost companies in the United States over \$20,000,000,000 per year (that's 20 billion)
- The medical inflation rate is spiraling out of control, compounding the problem exponentially
- MSDs account for 30% of all recordable injuries
- The average MSD costs \$14,567

Here's another one for you: Employees that experience a disabling musculoskeletal disorder have their income level decreased by an average of 40% over five years, which translates into a drastic and long-lasting impact on 1) their ability to provide for their family, and 2) their quality of life.

That is unacceptable to us. It's clear that a comprehensive MSD prevention process that reduces injury risk and enhances employee health is good for business and great for people.

The goal of this paper is to provide you with a framework and resources you can use to establish or improve your current ergonomics and MSD prevention process. We're honored to play a role in your MSD prevention efforts and we thank you for being a passionate advocate for every worker's safety and health. Thanks for spending a few minutes here with us!

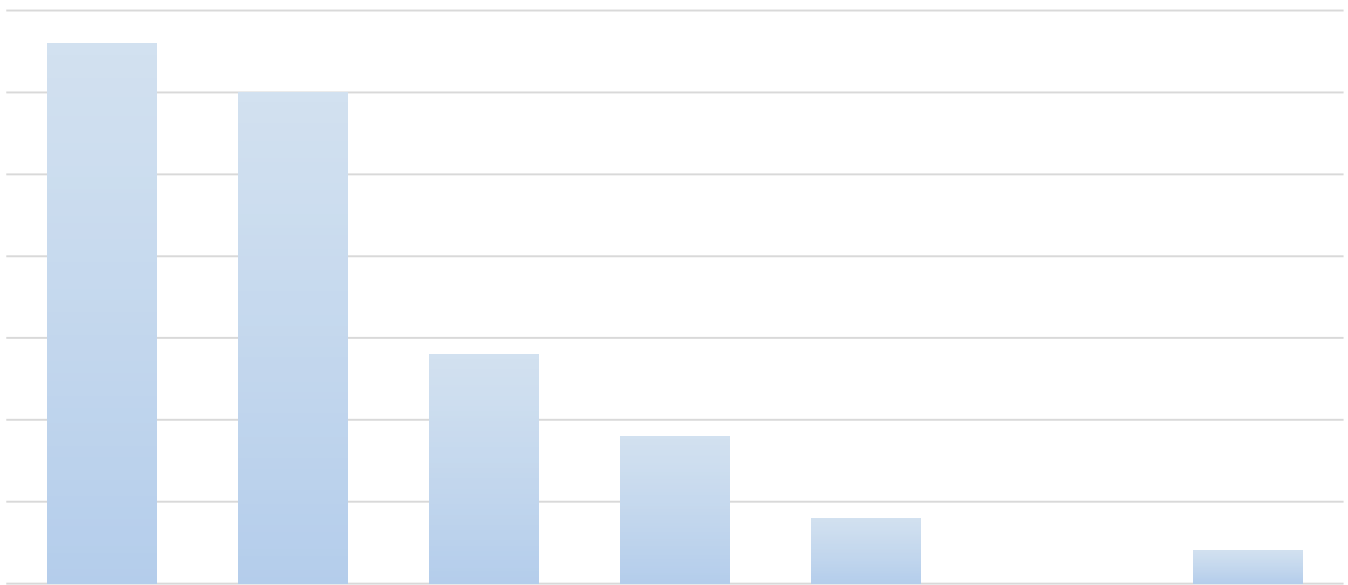


WHAT DOES SUCCESSFUL MSD PREVENTION LOOK LIKE?

Every successful business process begins with the end in mind. We need to get very clear about what success will look like so we can set our goals and expectations for this initiative. The MSD prevention process is no different. To help illustrate this point, here are a few case studies we've put together to demonstrate how MSD prevention impacts key health & safety metrics.

We don't show these to brag or be self-promotional, but to show what is possible for you after implementing and executing the MSD prevention process we will outline in the rest of the paper.

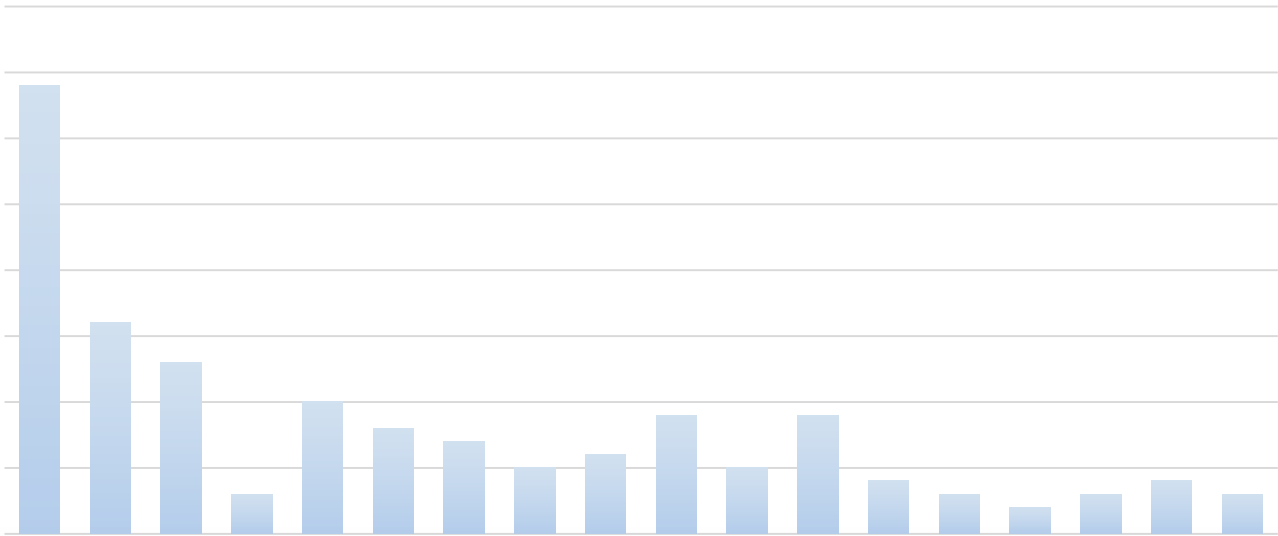
Case Study: 93% Decrease of OSHA Recordable Injuries



A comprehensive MSD prevention process helped Juno Lighting Group reduce recordable injuries by 93%. They also had a significantly decreased incident rate and lost workdays went from 288 all the way down to 0 in 2010. [Read the full Case Study.](#)



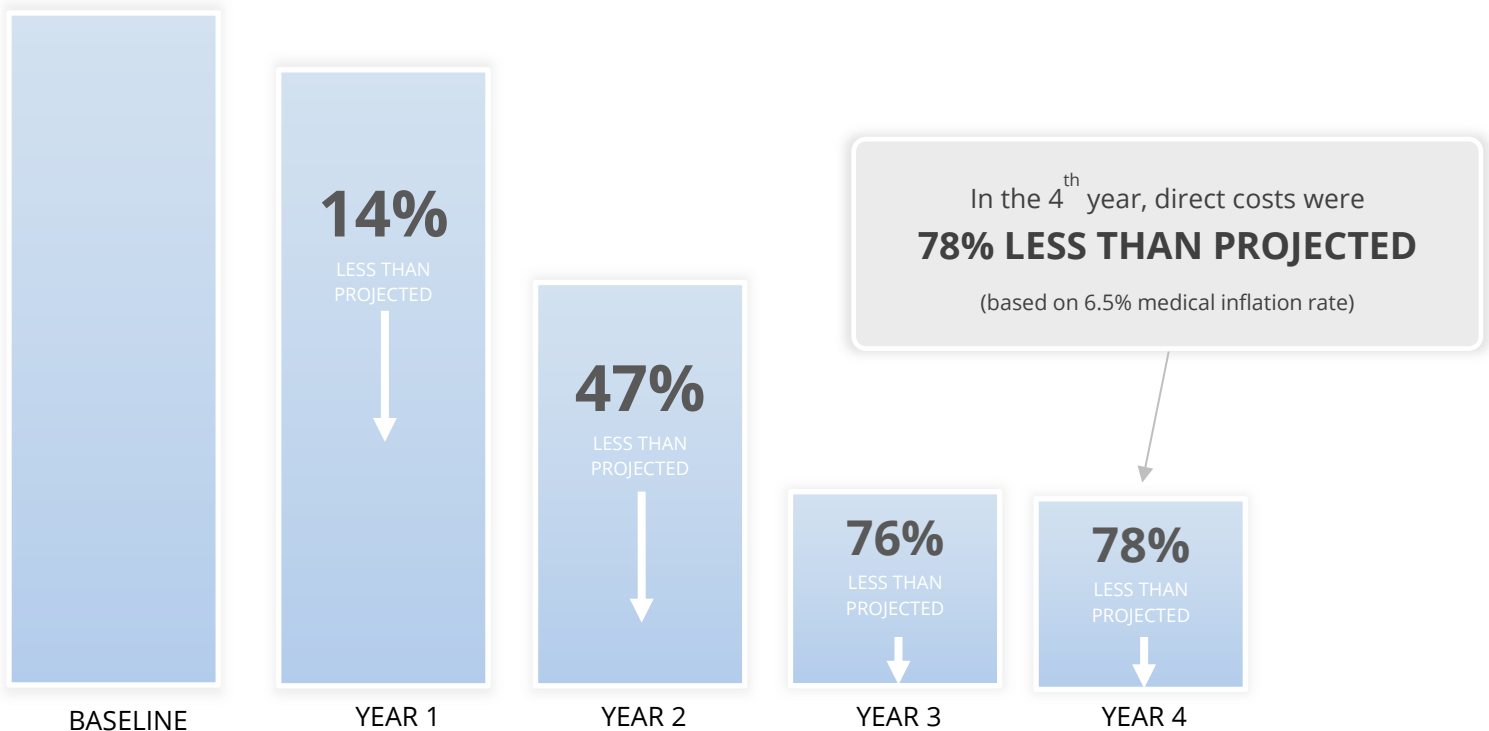
Case Study: 91% Reduction of MSD-related Cases



A comprehensive MSD prevention process helped Square D (Peru) reduce MSD-related cases by 91%. They also had significant reductions in incident rate, lost-time workdays and associated costs. [Read the full Case Study.](#)



Study: Cost-Reduction Data of Ergonomics Plus Clients



This Ergonomics Plus client study reviewed cost reduction data of 17 Ergonomics Plus clients. Only direct costs were included and a 6.5% medical inflation rate was used, making it a conservative representation.

We included this study to demonstrate that once you see significant reductions in key health & safety metrics, you will see a corresponding decrease in costs. This information can be used to make the business case for the program and get the management support you need to move your process forward.



The Goal is Zero

What does success look like? Zero. No matter where your MSD prevention process stands right now, your eventual goal is zero MSDs. Why? Because this is the level of commitment it takes for success. Here is how Schneider Electric CEO Chris Curtis puts it:



“We’ve always had a very good safety record, but for us, the breakthrough came in 2003. That year, our new president, my predecessor, set a goal of zero injuries. Today, I am proud to say our safety culture is stronger than ever, and safety is part of our DNA. From an unwavering focus on accident prevention to extending our message of safety beyond the workplace, keeping our employees and their families safe and healthy at work and home has become definitive of our culture.”

Chris Curtis
CEO, Schneider Electric

In 2012, Schneider Electric won the Green Cross for Safety Medal award. Their goal of zero had a profound impact on the key health & safety metrics they measure. Their business and their people are better off as a result.

(Disclosure: Schneider Electric is an Ergonomics Plus client.)

Proactive vs. Reactive MSD Prevention

Zero might seem like a distant and unreachable goal for you right now, especially if you are in the “reactive” stage of MSD prevention. This is where you are struggling with recordables, incident rate, high medical costs and other lagging indicators.

To start, you will measure success by the reduction of these health & safety metrics. As you can see from the case studies above, it takes some time but it is certainly possible for you. Once you get to the point when you have zero (or very few) MSDs in a year, should you stop this process? No!



When you get to this point, it's time to take your program to the next level. It's time for the proactive stage of MSD prevention, where you will start to measure risk reduction and other leading indicators.



REACTIVE

- **Improve lagging indicators**
 - OSHA Recordables
 - Incident Rate
 - Lost time days
 - Medical Costs

PROACTIVE

- **Improve leading indicators**
 - MSD Risk
 - Ergonomic opportunities identified & resolved
 - Training sessions completed
 - Audits completed

MSD Prevention Success

Getting from the reactive to the proactive stage of the MSD prevention process is vital to its long-term success.

That's where we're going. Now let's roll up our sleeves and get to work!



WHAT ARE MUSCULOSKELETAL DISORDERS? (And what causes them?)

Musculoskeletal Disorders are the enemy. As Sun Tzu famously said in *The Art of War*, "Know your enemy, and know yourself."

Musculoskeletal Disorders are injuries and disorders that affect the human body's movement or musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, blood vessels, etc.).

Note: Using terms like "repetitive motion disorder, repetitive stress injury or ergonomic injury" is inaccurate and creates a barrier to successful prevention strategies. Repetitive motion, repetitive stress and poor ergonomics are risk factors for MSDs, but because there are numerous causes and risk factors responsible for MSDs, we need to simply call them what they are: musculoskeletal disorders.

What Causes MSDs?

Musculoskeletal Disorders (MSDs) develop over the course of time as the result of exposure to many causative risk factors. Some of these risk factors relate to the design of the workplace and some relate to the individual worker themselves.

Ergonomic risk factors include high task repetition, forceful exertions and repetitive/sustained awkward postures.

Individual risk factors include poor work practices, poor physical fitness and poor overall health habits.

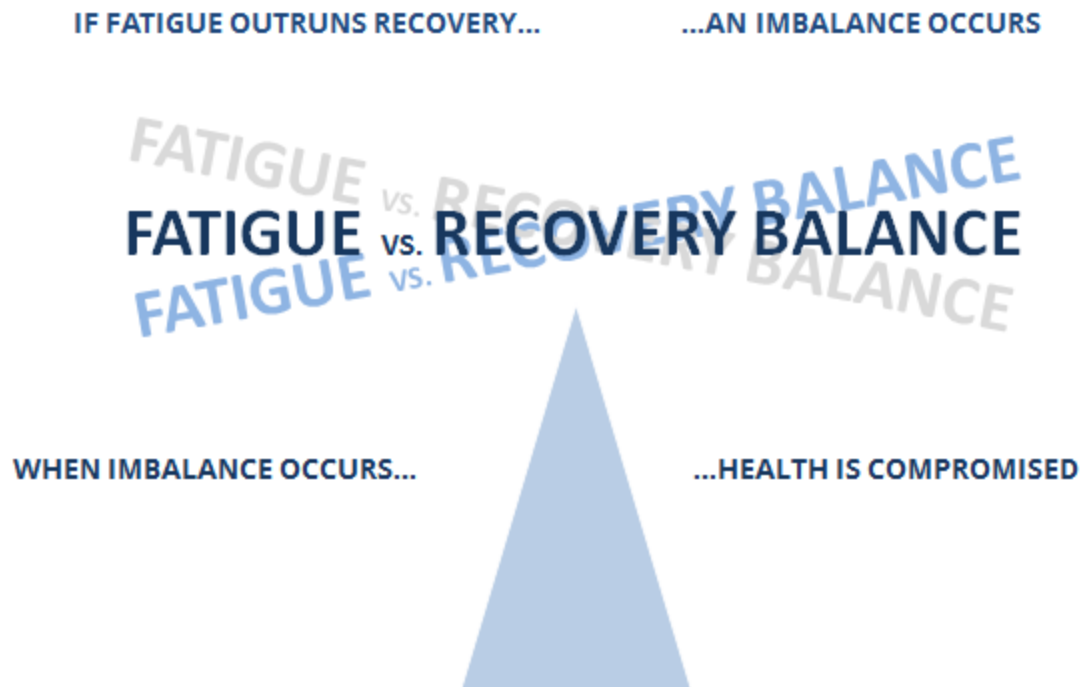
It's important to recognize all of the risk factors contributing to MSDs in order to develop a strategy to eliminate injury risk and prevent MSDs.



MSD RISK FACTORS



These risk factors cause musculoskeletal fatigue to outrun the worker's recovery system, translating into a musculoskeletal imbalance.

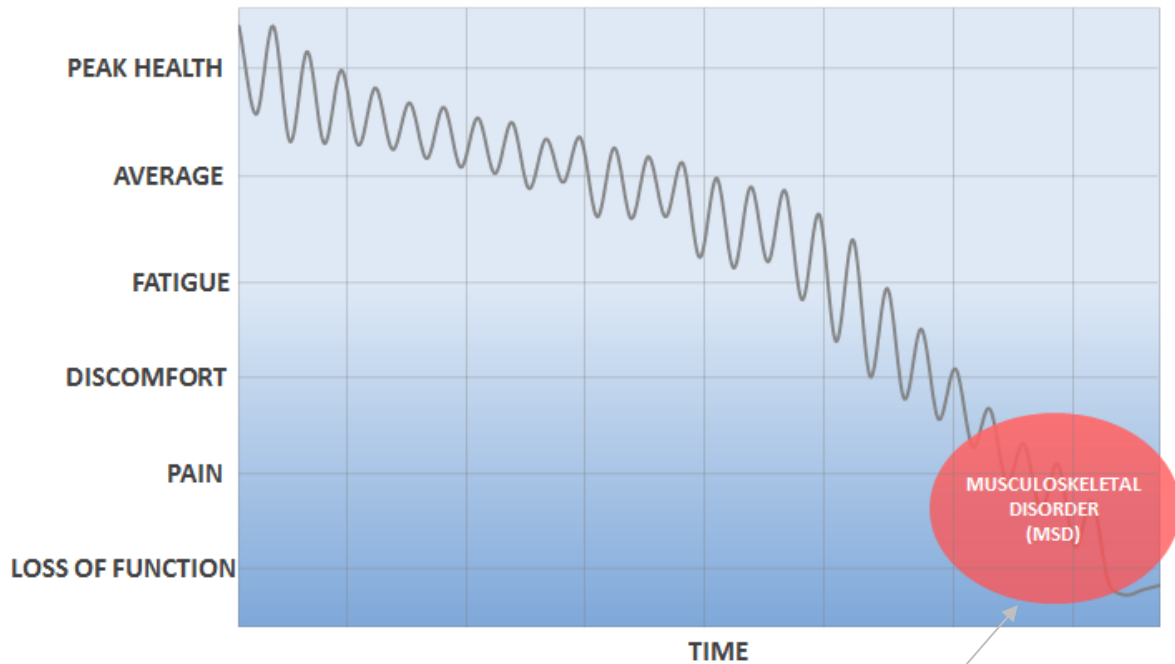




Over the course of time, this musculoskeletal imbalance leads to pain, loss of function and eventually an MSD.

See graphic below:

Formation of Musculoskeletal Disorder (MSD)



When a worker is exposed to MSD risk factors, their body is unable to recover faster than it is being fatigued. This leads to a musculoskeletal imbalance and eventually a painful musculoskeletal disorder.

How can this be prevented? A comprehensive MSD prevention process will systematically reduce MSD risk factors (both ergonomic risk factors *and* individual risk factors).

The next section in this paper will provide you with a proven framework for reducing MSD risk factors and preventing MSDs. **Think prevention!**



THE 5 KEYS TO SUCCESSFUL MSD PREVENTION

The 5 Keys to Successful MSD Prevention are based on the comprehensive MSD prevention process we use for clients. These are the keys to success we've learned over two decades of providing on-site services for many clients in many different industries. These are the unchanging, battle-tested fundamentals that we know to be true.

Each "key" is an integral part of the process. Take one away and you're left with a much less effective process and results will suffer.

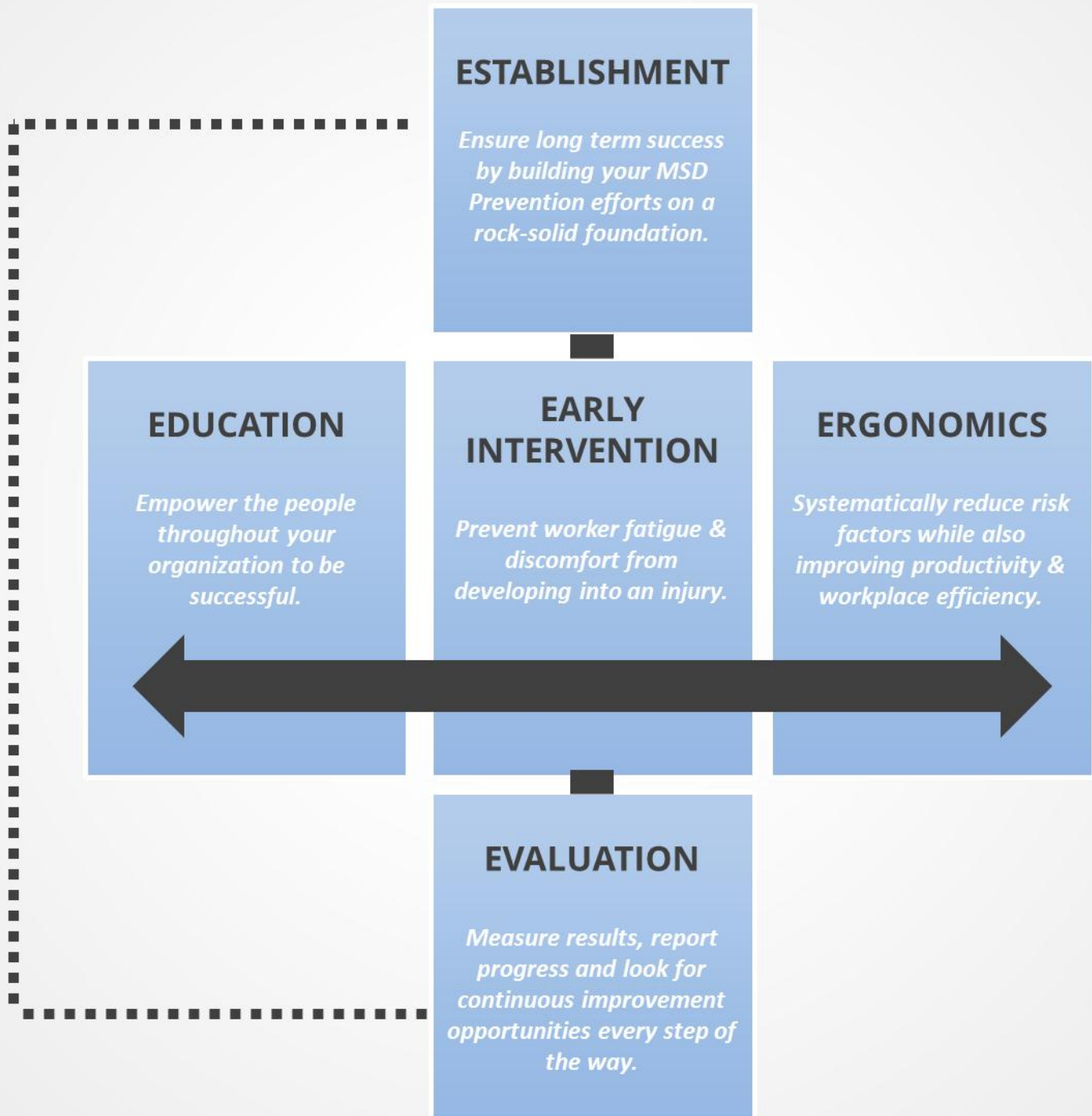
Here they are:

- 1 ESTABLISHMENT**
- 2 EDUCATION**
- 3 EARLY INTERVENTION**
- 4 ERGONOMICS**
- 5 EVALUATION**

The rest of this guide will explain what each key is, why it's important, offer an expert tip and provide you with a short checklist to get you started.



The E+ System is a comprehensive MSD Prevention Process that reduces all MSD risk factors.





1

ESTABLISHMENT

Ensure long term success by building your MSD Prevention efforts on a rock-solid foundation.

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WHAT IT IS

The Establishment phase of the MSD prevention process ensures that everyone in your organization is clear on the goals of the process and their role and responsibilities for achieving them. To put it another way, Establishment is the blueprint for success.



WHY IT'S IMPORTANT

Without a well-established process in place, MSD prevention efforts like ergonomics and employee training tend to operate in a haphazard manner. This is a common problem. Companies without clear goals, written guidelines, and assigned roles / responsibilities for the MSD prevention process are far less effective at reducing injury risk.



EXPERT TIP

For Establishment to be a huge success, you will need to put on your “marketing hat”. (Yes, you’ll have to add marketing to the collection of the many hats you already wear.) Why? Because success of the overall process will depend on buy-in and commitment at all levels of your company. Your role and responsibility is the *MSD Prevention Champion*.



CHECKLIST

Establishment Checklist:

- ✓ Establish specific, written guidelines for the MSD prevention process.
- ✓ Assign responsibilities for the MSD prevention process.
- ✓ Communicate responsibilities to managers, supervisors, ergonomics team members and employees to ensure they know what is expected of them and how they will be held accountable.
- ✓ Provide all responsible persons (above) with the authority, resources, information and training necessary to meet their responsibilities.
- ✓ Conduct basic training on the MSD prevention process for upper management, supervisors and engineers.
- ✓ Communicate management leadership of (and commitment to) the MSD prevention process to all employees.
- ✓ Communicate regularly with employees on the benefits and basics of the MSD prevention process (at least monthly).
- ✓ Involve employees in developing, implementing and evaluating elements of the MSD prevention process.
- ✓ Review injury/illness reporting logs and worker's compensation records to prioritize efforts and document MSD reduction goals.

Recommended: Employ or contract with an MSD prevention and ergonomic evaluation specialist to provide expertise, support and direction for the MSD prevention process.



2

EDUCATION

Empower the people throughout your organization to be successful.

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WHAT IT IS

Education and training is a process that ensures the entire workforce is fully aware of all risk factors that can lead to MSD; and not only know, but **apply** principles of MSD prevention. This is simple in concept, but difficult in practice. Remember that education and training is a process, not a one-time event that is quickly forgotten.



WHY IT'S IMPORTANT

MSD prevention is mostly common sense, and although it isn't rocket science, MSD risk factors and principles of prevention must be consistently reinforced before they are ingrained into the culture of your company. Every employee, from top to bottom, needs to understand the benefits of prevention and their role in the process. Educating them with consistent training ensures they have the know-how they need to be successful.



EXPERT TIP

Everyone should know the benefits of the MSD prevention process, basic principles of prevention and the core components of the process. Beyond that, set specific training objectives for each training group. Here are some examples:

Management Training Objectives:

- » Participants will learn management roles and responsibilities related to the MSD prevention process.



- » Participants will feel free to ask questions and provide commentary / discussion related to subject matter.
- » The primary objective is to secure the commitment and support of management to implementing the MSD prevention process.

Engineer Training Objectives:

- » Participants will become knowledgeable about the human body's capabilities and limitations.
- » Participants will learn how to identify MSD risk factors and physical stresses related to jobs that may contribute to MSD.
- » Participants will learn how to identify high risk job demands and develop possible solutions that will reduce or eliminate exposure to MSD risk factors.
- » Participants will learn how to utilize ergonomic evaluation tools which objectively measure ergonomic design risk factors.
- » Participants will learn how to use checklists to proactively design new work processes with ergonomics in mind.
- » Participants will practically apply learning and demonstrate the ability to use objective ergonomic measurement tools by performing two ergonomic assessments and documenting these assessments in a report form to be evaluated by the trainer.

Ergonomics Team Training Objectives:

- » Participants will become knowledgeable about the human body's capabilities and limitations.
- » Participants will learn how to identify MSD risk factors and physical stresses related to jobs that may contribute to MSD.
- » Participants will learn how to identify high risk job demands and develop possible solutions that will reduce or eliminate exposure to MSD risk factors.
- » Review expectation that members are expected to attend and participate in team meetings.

Supervisor Training Objectives:

- » Supervisors will learn the importance of frequently encouraging employees to report early discomfort and MSD signs.
- » Supervisors will be encouraged to regularly ask employees to report any early MSD signs sooner rather than later.



- » Supervisors will learn how to respond to employee early reports by being "over the top" positive in their response to any employee report of discomfort.

Employee Training Objectives:

- » Proper body mechanics
- » Ergonomics basics
- » Good health habits
- » Signs and symptoms of MSDs
- » Basic self-care techniques
- » Accept responsibility for their own health and well-being
- » Learn the fundamentals of living a healthy lifestyle
- » Create a written set of goals with respect to their personal wellness
- » Develop a step-by-step action plan to accomplish their goals



CHECKLIST

Education checklist:

- ✓ Develop training programs for management leadership, ergonomics team, engineers, supervisors and employees.
- ✓ Develop a schedule for employee classroom training.
- ✓ After formal classroom training, follow up with one-on-one training on a priority basis. Should include information about proactive approaches to MSD management and prevention.
- ✓ Document the objectives, attendance and results of each training program.
- ✓ Modify and improve training programs based on review of results.



3

EARLY INTERVENTION

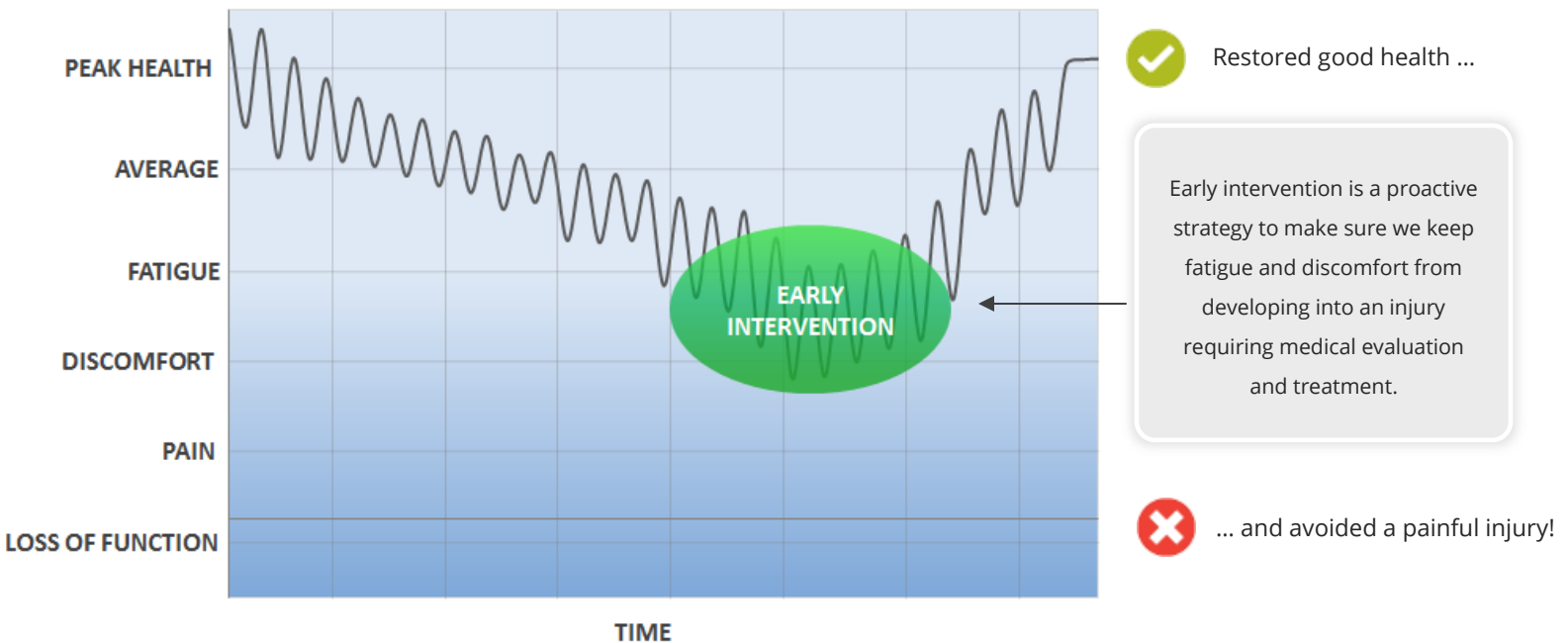
Prevent worker fatigue & discomfort from developing into an injury.



WHAT IT IS

Early intervention is a proactive strategy to find early signs of an injury and prevent it from happening. When employees recognize they are experiencing fatigue and discomfort (early warning signs of MSD), they are encouraged to report it. Once the issue is reported, self-help tools should be readily available to the employee through an experienced injury prevention specialist.

Early intervention is about **prevention**, not treatment. Preventive consultations should be available to each and every employee, and the self-help techniques recommended should not be therapeutic in nature and should serve as a means to help employees counteract daily fatigue that could potentially turn into an injury that requires medical evaluation and treatment. Prevention is much better than treatment!





WHY IT'S IMPORTANT

Prevention is always better than treatment, and one injury at work is too many. If you're serious about this philosophy, early intervention has to be a part of your MSD prevention toolbox. We know MSDs develop over the course of time as a result of excessive daily fatigue outpacing the body's ability to recover. This means the early warning signs of the next 2-3 years' worth of MSDs at your facility are out there right now! Seek them out and **think prevention.**



EXPERT TIP

Injury prevention tools should be readily available to each employee through an experienced injury prevention specialist. These tools include:

- » Preventive warm-up exercise
- » Proper lifting techniques
- » Proper body mechanics
- » Identification of ergonomic improvement opportunities
- » Preventive counteractive stretching exercises
- » Proper resting/sleeping posture
- » Strengthening exercises
- » Fatigue recovery and sleep
- » Proper nutrition and hydration
- » Good health habits
- » Personal fitness and wellness



CHECKLIST

Early Intervention Checklist:

- ✓ Document a policy and best practices for encouraging early reporting of fatigue and discomfort.
- ✓ Document a policy that provides a clear way for employees to report excessive fatigue, discomfort or MSD signs and symptoms.
- ✓ Make sure all employee reports are dealt with in a prompt and timely manner.
- ✓ Employ or contract with a prevention specialist to address early reports of fatigue and offer self-help guidance for employees who do not need a medical evaluation.
- ✓ Assign responsibility for the early reporting system and outline it in the written MSD prevention policy.



4

ERGONOMICS

Systematically reduce risk factors while also improving productivity & workplace efficiency.

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WHAT IT IS

A systematic ergonomic improvement process is a cornerstone of successful MSD prevention efforts. Ergonomics is not just about doing ergonomic assessments; it's about making cost-effective *improvements*.

Here's the process that works well for us:

- 1. Develop a prioritized list of jobs for analysis.** The list should be developed based on an initial facility tour, ergonomic walk-through audit, a review of injury / MSD history and data collected from employee surveys.
- 2. Conduct ergonomic analysis for all jobs in the workplace.** The next step in the process is to perform ergonomic analysis of each job using objective ergonomic assessment tools.

Recommended ergonomic assessment tools:

- » NIOSH Lifting Equation
- » NIOSH Lifting Equation (Short form)
- » Rapid Entire Body Assessment (REBA)
- » Rapid Upper Limb Assessment (RULA)
- » Snook Tables
- » Hand-Arm Vibration (HAV) Exposure Assessment

(We've put together step-by-step guides to all of these tools. [Click here to download them all at no charge.](#))



3. Develop a prioritized ergonomic opportunity list. Prioritize opportunities with a prioritization tool such as ICE (Impact, Cost, Effort). This will help you sort through ergonomic opportunities that have been identified and need to be accomplished but compete for the same resources.

4. Determine the best solutions with team approach. A multi-disciplinary ergonomic team should work together to determine the best engineering or administrative controls to implement.

5. Obtain approval and implement solution. If significant capital or human resources are required for the ergonomic improvement, you will need to obtain project approval from the management or leadership team. In these situations, it's important to make a compelling business case for the ergonomic improvement using cost justification to prove a return on investment (ROI).

6. Evaluate the ergonomic improvement. After the ergonomic improvement have been made, it's important to conduct a survey of all affected parties to obtain feedback to see if any adjustments are needed. You can use a short survey to solicit the opinions and perspective of affected employees regarding the effectiveness of this ergonomic improvement.

Now return to the ergonomic opportunity list for your next project!



WHY IT'S IMPORTANT

Ergonomics **must** be part of a comprehensive MSD prevention process. Ergonomics is part of your company's commitment to providing a safe place of work for your people. It shows you care, and reduces ergonomic risk factors that contribute to MSDs. There are other benefits as well, such as increased productivity, product quality and employee engagement.



EXPERT TIP

Guess who the real ergonomics experts are ... employees! They are the ones doing their job day in and day out, and they should be involved in the process. They should have representation on the ergonomics team, participate in employee surveys and feel involved in this process.



CHECKLIST

Ergonomics Checklist:

- ✔ Organize an ergonomics team with a charter that is multi-disciplinary and has both management and employee representation.
- ✔ Train members of the ergonomics team in the evaluation, recognition and control of ergonomic risk factors.
- ✔ Make sure the ergonomics team has regular meetings and document them.
- ✔ Identify members of the ergonomics team to employees as contacts for ergonomic concerns.
- ✔ Put a system in place to handle employee concerns regarding ergonomics in a timely manner.
- ✔ Prioritize a list of jobs for ergonomic analysis.
- ✔ Establish a schedule for ergonomic analysis on a prioritized basis.
- ✔ Make sure there is a schedule and tracking process for control measures.
- ✔ Document a review process for implemented controls that determines the effectiveness of controls.
- ✔ Include ergonomic risk factors in job safety analysis.



- ✓ Train engineers on ergonomic design factors.
- ✓ Put engineering ergonomics specifications in place for new and modified equipment jobs and processes.
- ✓ Make ergonomic approval a requirement prior to purchasing of new equipment and/or implementation of new processes.
- ✓ Actively involve the ergonomics team in new product development, production design and changes to existing operations.



5

EVALUATION

Measure results, report progress and look for continuous improvement opportunities every step of the way.

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WHAT IT IS

Monthly Report: Every month, a report should be generated that documents early intervention consultations, ergonomic opportunities identified, ergonomic improvements made and formal and 1-on-1 training sessions

Annual Audit: Conduct an annual audit of the entire MSD prevention process, from top to bottom. The audit should thoroughly review each element of the MSD prevention process as well as the year's results (injury & MSD data).

The annual audit will ensure that all MSD prevention best practices are implemented at your facility, and that you are getting results out of the program.



WHY IT'S IMPORTANT

Regular evaluation of the MSD prevention process is important for a couple reasons.

1. Evaluation allows you to look for continuous improvement opportunities. A monthly report and annual audit will identify problem areas and allow you to prioritize your efforts and fill in the gaps in your process.

2. Evaluation proves the value of the program and makes the case for additional resources. By conducting regular evaluations of the process, you will generate tons of useful data. Use it to demonstrate the value of the program (cost reduction, prevented injuries, lower incident rate, increased productivity, etc) to the rest of your management team and prove once and for all that safety and health is a driver of your company's goals.



EXPERT TIP

Contract an outside auditor to evaluate your facility annually. This will not only uncover improvement opportunities, but will add a tremendous amount of credibility to the program.



CHECKLIST

Evaluation Checklist:

- ✓ Conduct and document an annual self-assessment of each element of the MSD prevention process.
- ✓ Contract an outside auditor to do an audit of your MSD prevention process. Do this annually and document results.
- ✓ Consult employees on their views on the effectiveness of the program and identify significant deficiencies.
- ✓ Track and document early intervention consultations and outcome.
- ✓ Track and document MSD cases, lost/restricted days, MIR and costs apart from all other injuries and illnesses.



FREE MSD PREVENTION RESOURCES

We're committed to bringing you educational resources to help you navigate how to get started or improve your ergonomics and MSD prevention efforts. These resources can help you execute on the strategies we presented above.

We hope you can find some value in the free resources provided below, and we'd love to know what you think. If you'd like to provide feedback or ask a question about anything on our website, [shoot us an email](#) or give us a call at 1.765.384.4499.

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[Building Wellness from the Inside Out](#)

[Employee Ergonomics Survey](#)

[Ergonomic Improvement Process Flowchart](#)

[Injury Prevention & Wellness Handout Archive](#)

[Step-by-Step Guides to our Recommended Ergonomic Assessment Tools](#)

[The Ergonomics Plus Mini-Audit](#)

[The Five Essential Pillars of MSD Prevention](#)

[Webcast: The Workplace Athlete Model of MSD Prevention](#)

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If you liked this paper, you might also be interested in our monthly email newsletter. Sign up today for more ergonomics and MSD prevention articles and tips. You'll also be the first to know when we release larger content pieces like this paper and the resources listed above.

[Click here to sign up.](#)



Thanks!

Thanks again for spending some time here with us. We know how busy you are and we're glad you decided read our paper. We hope it's been helpful and that you found value in it.

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WHAT'S NEXT?

Now, you're at something of a crossroads.

You may choose to pool your internal resources, develop a comprehensive MSD prevention process and manage it on your own.

You've got lots of free content from our website that will help you do just that. Or you may decide you want some help.

You may want a partner with the experience, knowledge and personnel to execute a best-in-class MSD prevention process.

If that would be helpful to you, Ergonomics Plus services might be the right vehicle to help you see what the next level looks like. We'd be honored to partner with you.

Thanks for reading. And don't forget we've got a lot more free content for you, so stay tuned.

Best Regards,

Mark Middlesworth

Founder, Ergonomics Plus

[Click here to get in touch.](#)



ABOUT ERGONOMICS PLUS

We hope you found this paper helpful.

Who are we? Founded in 1989, Ergonomics Plus helps companies with industrial and warehouse operations prevent musculoskeletal disorders (MSDs) and improve productivity. The idea behind our company is that prevention is always better than treatment, and one injury at work is too many.

We partner closely with proactive Health & Safety leaders to execute our [MSD prevention process](#), taking Health & Safety programs to the next level. [The results](#) of this partnership are good for business and great for people.



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