Ergonomic Risk Management Guide

Chubb: Practical Methods for Managing Ergonomic Risk

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Chubb Risk Consulting

Why Ergonomics?

Is your organization having a significant number of overexertion and repetitive motion injuries?

Do you have many cases of injury related lost work time or restricted duty?

Are the medical costs to treat injured employees skyrocketing?

Are your insurance premiums increasing due to the number of work-related injuries?

Are productivity and quality metrics being affected by high employee turnover and low morale?

If you answered "yes" to any of these questions, consider ergonomics as a solution. Ergonomics is proven to reduce the risk factors that lead to musculoskeletal disorders (MSDs) and reduce the costs associated with MSDs. It increases productivity by improving the efficiency of processes and reducing cycle times; improves employee morale; and impacts many other areas within your organization, like safety and quality.

How do you know ergonomics make sense for your company?

There are several indicators that ergonomic problems may exist at your facility. It is important you look at your operational data in order to make an informative decision and prepare a business case for developing an ergonomic risk management program.

1 / Review Your Records

The first step to take is to determine if you have a problem regarding musculoskeletal disorders (MSDs) and employee complaints about discomfort and pain. There are several sources that can show you trends and problem areas, such as:

- First Aid Logs
- OSHA Logs or other injury/illness statistics (department, job, body part)
- Injury Root Causes
- Workers' Compensation Claims
- Group Health and Disability Insurance Claims
- Health Care Provider Daily Logs
- Lost Time and Restricted Duty Records

When reviewing your records, use the following recommended steps:

1. Start analyzing the information related to OSHA recordable cases. These are the most serious cases in your organization and you should identify the ones that resulted from exposure to ergonomic risk factors, such as:

   - exerting high or sustained levels of force (which leads to fatigue),
   - working in awkward or extreme postures,
   - performing repetitive tasks,
   - working in static postures for a long period of time,
   - working in extreme temperatures or in areas with poor lighting levels, high noise levels, vibration, etc.

2. Continue your review by looking at first aid logs. If you find a high number of these, it might indicate you are having risk factors and it is only a matter of time before you have OSHA recordable cases.

3. Finally, look at any employee complaints or engineering concerns in other company operations such as sales and marketing or administration.

It is recommended you look at the records for the last three years in order to have a significant data set. Specifically, collect information about the type of

injury/illness, body part affected, job function and total number of cases per job function, restricted-duty days, days away from work, etc. This information will not only help you build the case for ergonomics but also will allow you to create priorities for the critical areas that you will need to assess first.

2 / Talk To Your Supervisors And Managers

Medical information is not the only source of information to focus on. There are other areas that could show the impact of ergonomic injuries and problems on your productivity metrics.

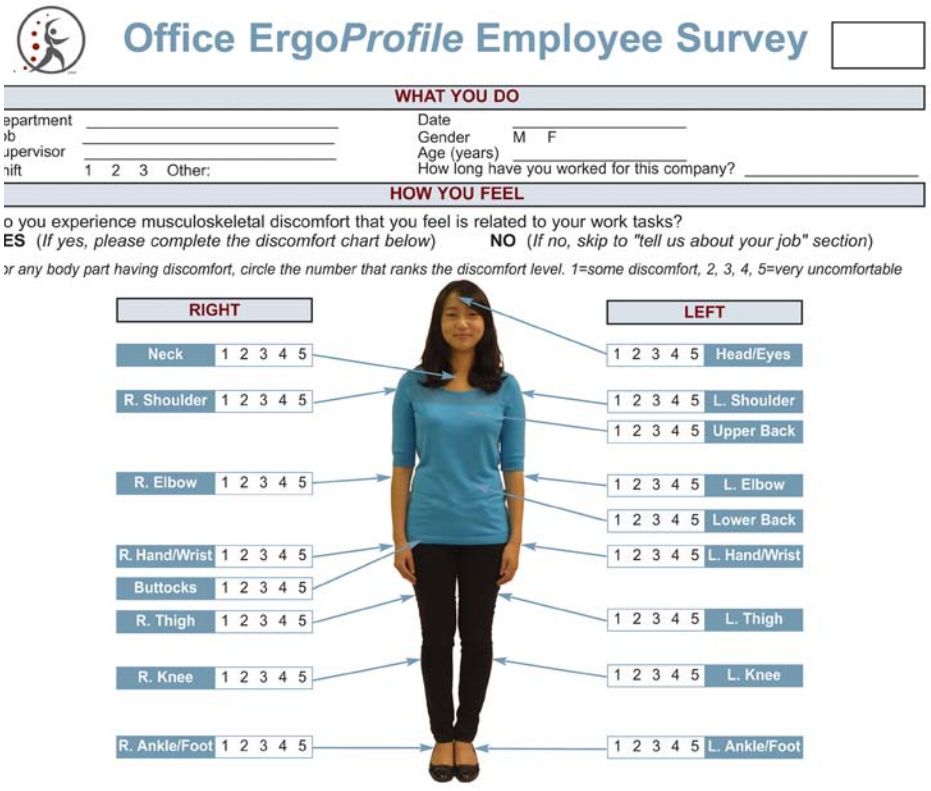
The goal here is to talk to your supervisors and managers about specific issues in their areas, such as: absenteeism, turnover, production, and quality. This should also help to get them involved with future efforts.

- **Absenteeism/Turnover**–Jobs and departments with high absenteeism may indicate ergonomic problems in that area. High worker turnover may indicate that the job subjects the workers to significant ergonomic stress or that there is an insufficient "ramp-up" or conditioning period for new hires.
- **Production Scheduling Information**–Medical incidence and absenteeism may sometimes correlate to production schedules. For example, certain jobs may cause more problems than others, or periods with an increased rate of production may result in high incidence shortly afterwards.
- **Quality Information**–Quality problems may indicate that workers are fatigued, that the job is too difficult (either physically or mentally), or too much work is being completed too quickly.

3 / Talk To Your Employees

Asking your employees to rate how physically demanding their jobs are on a scale from 1 to 10, can offer clues regarding the comfort and safety of the job. Another practice would be the use of an employee discomfort survey to discover what concerns employees have, which part of their body is affected, and potential causes of their discomfort.

An example of an employee discomfort survey is shown below.



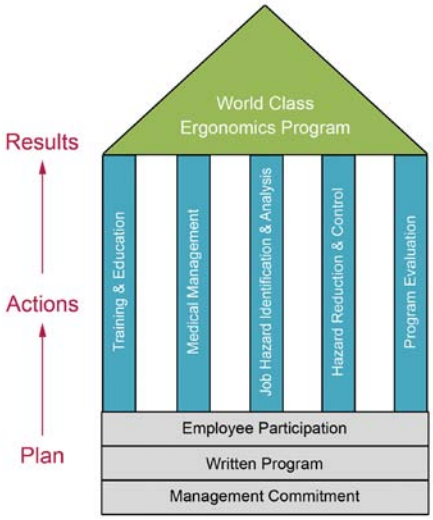
4 / Observe The Jobs To Identify Potential Risk Factors

It will also be beneficial to visit the different areas in your site and observe several different jobs. The main goal of this practice is to identify any of the ergonomic risk factors that could be present in those jobs. This could be done by using a simple checklist or screening tool, or using a modified version of your Job Safety Analysis (JSA) which should also include ergonomic risk factors.

Once you see that ergonomics will make an impact on your organization, talk to management and recruit their support to implement an ergonomics program that will help reduce your MSDs and all the costs associated with them.

Critical Elements of a Successful Ergonomics Program:

Designing a program can be viewed as building a house. You start with a good foundation before incorporating the columns or pillars that will support the roof structure. Following this analogy, we can show the main elements of a successful program with the diagram below:



The first (and probably most crucial) element when starting an ergonomics program is obtaining management commitment. Failure to recruit management commitment will typically lead to the failure of the program due to lack of support from middle management and supervisors. Developing a written program is also crucial in order to define the roles and responsibilities, processes to be followed and metrics that will show the progress of the program. Once management is on board, then it is equally important to ensure employee participation in all levels and processes of the program.

Once the foundation is set, start taking action by carrying out the different key processes within the program:

- Develop and provide training & education to all levels of the organization. (Refer to Chubb's Ergonomic Toolkits to help you with this element.)
- Incorporate ergonomics into your existing medical management element
- Define and execute processes for job hazard identification & analysis
- Implement solutions that will result in hazard reduction & control
- Define and review metrics as well as audit all elements as part of the program evaluation. Your Chubb Risk Consulting Services professional can assist in a review of your program.

At the end, you should have a comprehensive program that transforms the organization from a reactive approach to ergonomics to a proactive one. Becoming a world class program consists of transforming your efforts using a continuous improvement mentality and maturing your program from a process to a culture where everyone is ultimately responsible for ergonomics.

A / Setting The Foundations For A Program—The Planning Stage:

STEP 1 / Management Commitment

This element looks at the motivation and dedication of the company towards the goal of reducing ergonomic injuries and creating a workplace free of risks to their employees. No matter the size of the company, management needs to:

- Identify resources for the program, including defining roles and responsibilities, assigning personnel to those roles, and providing additional resources like budget and time allocation for team members to work on their efforts
- Ensure that all responsible personnel have the necessary authority, resources, and access to information needed to perform their assigned responsibilities
- Ensure that all those involved in the program are accountable for performing their responsibilities
- Promote early reporting of MSDs and employee participation in the program
- Include program metrics as an integral part of the company's safety, quality and productivity metrics
- Communicate regularly with employees about the status and progress of the program
- Facilitate issue resolution when major obstacles are identified by the team members

STEP 2 / Written Program

A written ergonomics program documents a company's ergonomics efforts and provides a "road map" for its ergonomics activities. The program should outline management's commitment to ergonomics in the facility; the elements and responsibilities of employees at all different levels; and the means by which the goals and activities of the program will be accomplished.

At a minimum, the overall written plan should allow someone unfamiliar with the company and the ergonomics program to identify the following items:

- Purpose of the ergonomics program
- Goals and objectives of the program (short term and long term)
- Processes that will be used to achieve the goals and objectives
- Framework of the program including the roles and responsibilities of those (both management and employees) involved
- Resources committed to the program
- Constraints that a company may have that could impact the ergonomics efforts
- Means by which the program's success will be measured, tracked, and compared
- Forms of communication that will be used to document and market the program

The complexity of this document will depend on the size of the organization. An example of a program outline is presented below:

- Mission Statement
- Goals and Objectives of the Program
- Scope
- Roles and Responsibilities
  - Management Leadership
  - Employee Participation
  - Ergonomics Team
- Process
  - Training and Education
  - Medical Management
  - Job Hazard Identification and Analysis
  - Hazard Reduction and Control
  - Program Evaluation
- Appendices and Documentation

A sample written ergonomics program template has been provided to assist you in developing your own program. (See Appendix)

STEP 3 / Employee Participation
Once you have the commitment from management and a written document that defines how the program should run, it is important for the success of the program to get the interest and involvement of the employees in all the different processes. After all, the main goal of this program is to make sure that their jobs are safe for them to perform. Employees are the main focus because of their knowledge of the operations and job tasks. They need to know the formal channels for early reporting of MSD signs or symptoms, as this is their main responsibility within the program. Also, they need to be involved in the analysis of their job tasks, brainstorming and implementation of solutions, and evaluation of the program. In addition, some employees should be part of the ergonomics team driving the assessments and implementation efforts of the site.

By involving employees in the whole process, you will see benefits such as increased job satisfaction, improved problem-solving capabilities, and increased likelihood that the proposed changes to the job tasks will be accepted.

B / Defining And Following The Processes—The Action Stage:

STEP 4 / Training and Education
Everyone in the organization needs to know at least the basics about ergonomics. It is important to create training materials that target the different groups within the organization. Management should be trained first, followed by the members of the ergonomics team, supervisors, and then all employees.

Through management training, you will get commitment for the resources needed. The ergonomics team members need the most detailed training since they will be leading the efforts by performing assessments and implementing effective solutions. The supervisors play an important role in early reporting; therefore, they need to know the process that the employees need to follow and facilitate it. Finally, awareness training should be provided to all employees. Everyone should learn what the main risk factors are and the signs and symptoms of MSDs. It is said that the most important job employees have within the program is early reporting of symptoms. Making sure that they know what to look for is critical.

STEP 5 / Medical Management
Having a process for managing ergonomic injuries is vital in order to identify the procedure and parties responsible for initiating medical treatment protocols for an injured employee. Your health care provider and workers compensation insurer need to work closely with you to establish the basic elements of the process, including:

- Early problem recognition and reporting
- Treatment protocols
- Administration of conservative in-house care
- Systematic monitoring
- Communication methods between the employer and the health care provider
- Workplace follow-up evaluation
- Return-to-work program

In effective programs, health care providers and insurers are part of the ergonomics team as they interact and participate in the evaluation process and exchange information about MSDs with the team.

Since recommendations for medical management of MSDs are always evolving, this element should be frequently reviewed and updated.

STEP 6 / Job Hazard Identification and Analysis
Define two processes for job hazard analysis: a reactive process, for when the employee has already been injured, and a proactive process, for analysis prior to complaints of pain or injury.

Whether the process is reactive or proactive, start by conducting a trend analysis to identify the areas with the biggest concerns; those will be your priorities. For the reactive process, make sure that the evaluator talks with the operators and familiarizes with the job in order to effectively assess it. Videotaping the operations is recommended to be able to identify the risk factors present and analyze the job using the deep-dive tools that apply to the specific situation. For the proactive process, it is important to train designers, engineers, or process owners about ergonomic guidelines so that they can incorporate those concepts into new processes and product designs.

STEP 7 / Hazard Reduction and Control
In order to help eliminate or at least reduce the ergonomic risk factors identified in the analysis stage, engineering and administrative controls should be considered.

Engineering controls are changes made to workstations, products, tools, machinery, and the work environment that alter the physical composition of a work area or work process. The goal of an engineering control is to eliminate or significantly reduce the ergonomic risk factors associated with the job. When designing modifications, it is important to ensure that additional stressors do not result from proposed changes. Examples of engineering controls include:

- Providing adjustable height worktables
- Using mechanical assist devices such as lift tables and vacuum handling systems
- Redesigning processes to reduce insertion forces
- Using powered tools instead of manual tools
- Automating a process to eliminate repetition and/or awkward postures

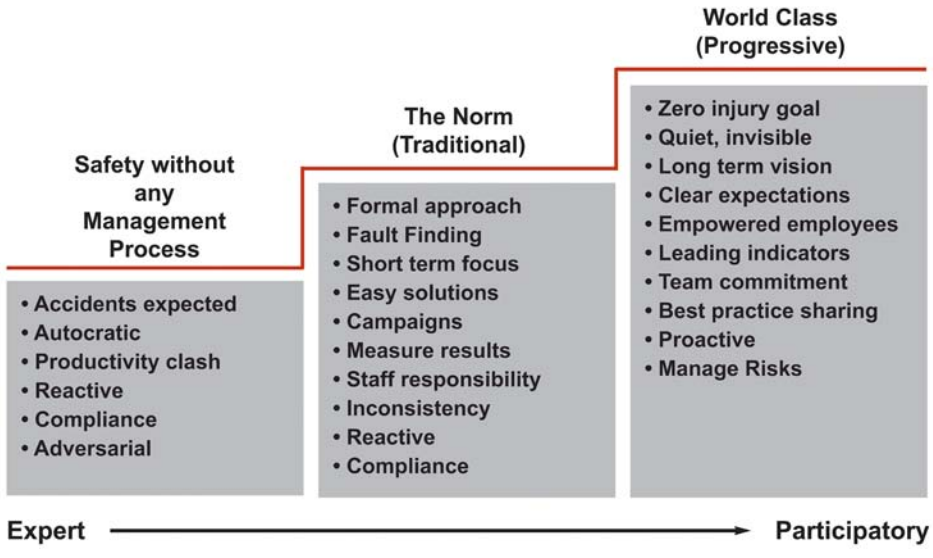
In contrast to engineering controls, administrative controls are aimed at regulating and minimizing exposure to ergonomic risk factors without making physical changes to the work area or work process. Examples of administrative controls include:

- Providing more and/or longer rest breaks
- Performing stretching exercises
- Implementing job rotation in high risk areas
- Expanding the number of tasks performed (job enlargement)
- Providing body mechanics training

Remember to plan not only for the implementation of the controls but also for following up to make sure that the solutions are working as intended. Training on the new controls should also be incorporated as part of the implementation stage.

STEP 8 / Program Evaluation
The goal of the program evaluation is to ensure that all the elements are functioning well. There are different types of evaluations that could be conducted. A formal audit form can be developed internally and used every year to review the progress and state of the program. An external group could also conduct an audit and provide you with recommendations for further improvements. Another option is to have general evaluations, in which you ask questions about the strength and weaknesses of the program, reduction in costs and injuries, increase in comfort and productivity, possible improvement areas, etc.

Another key component is to define metrics that will show the evolution of the program. It is important to incorporate metrics that look at the performance of the program (leading metrics), like the percentage of employees trained, areas evaluated, or implementations completed, as well as following the injury rate trends (lagging metrics).



STEP 9 / Record Keeping
It is important to document all efforts. Effective implementation of an ergonomics program requires some written documentation describing the employer's commitment, goals, and plans for the program. This should be communicated to all employees, along with how each of the various elements will be implemented and who has responsibility for those elements. Additionally, written documentation should be established for all ergonomics projects and efforts. At a minimum, the following should be documented:

- Written program
- Team meetings and activities
- Trends analysis
- Job analysis and evaluation
- Prioritization
- Controls implemented
- Projects and timetables
- Training records
- Audit reports

Documentation of all ergonomic efforts is important for several different reasons, such as justification of solutions, understanding the history of efforts made, legal reasons, etc.

STEP 10 / Continuous Improvement
The ergonomics program should be viewed as a process for continuous improvement. There is a starting point, but it needs to constantly evolve until it becomes a culture of excellence. By leveraging employees, integrating the program into existing systems, and gaining management commitment and accountability, the program can develop into an integral, value-added part of the business culture.

In the diagram below, we can see how ergonomic programs usually evolve through time. It mainly starts with an effort lead by just one person, who is the expert and the main driver of the efforts, trying to react to accidents and injuries. Organizations reach the traditional model once they have a formal written program. At this stage, there are more resources available, but the program is still reactive

in nature. In order to get to the world class model, the organization has to be experiencing an ergonomics culture, where everyone is responsible for the success of the program and is committed to the goal of zero injuries.

Final Thoughts...

Your organization does not have to be large in order to be successful in managing ergonomic risk. Just make sure that you have adapted and applied the elements above in manner that works for your company.

If you are a small organization, the owner or on-site manager should serve as the sponsor for the program who can lead its efforts. Training can be achieved by using public access information or having one person become the expert, and afterwards, the trainer for the organization. Using simple checklists to identify risk factors and concentrating on the critical jobs (top 20%) should help with the analytical part. Consider using external consultants for those jobs that are most critical or dangerous. Finally, research cost-effective solutions that will allow you to eliminate or reduce the risks without breaking the bank. Expensive solutions are not always the best solutions!

For larger organizations, consider incorporating the ergonomics program into other on-going efforts, like lean manufacturing, quality or safety initiatives. In order to create your ergonomics team, identify employees from different areas or departments that can bring different points of view to the table, especially when analyzing and generating ideas for controls. Defining a separate budget for this program will also help in making sure that you can have funds available for your solutions and not have to compete with other priorities or initiatives within the company.

Here is a list of the ergonomic resources available from Chubb:

Chubb Ergonomics Toolkit: Basic Principles of Ergonomics

Chubb Ergonomics Toolkit: Office Ergonomics

Chubb Ergonomics Toolkit: Industrial Ergonomics: Manual Material Handling and Awkward Postures

Chubb Ergonomics Toolkit: Industrial Ergonomics: Repetitive, Upper-Extremity Tasks and Awkward Postures

Chubb Ergonomics Toolkit: Laboratory Ergonomics

Chubb Ergonomics Toolkit: Telecommuting Ergonomics

Chubb Ergonomics Toolkit: Impromptu Ergonomics

Glossary

Acute trauma: generally attributed to a one-time, specific, instantaneous event.

Administrative controls: changes aimed at regulating and minimizing exposure to ergonomic risk factors without making physical changes to the work area or work process.

Bursitis: inflammation of a bursa sac.

Carpal Tunnel Syndrome: group of signs and symptoms associated with swelling within the carpal tunnel. Exposure to stressors can cause swelling within the tunnel as the tendons enlarge and pinch off the median nerve, resulting in pain and numbness.

Cumulative trauma: results from exposure to repetitive, forceful, or awkward actions over a period of time.

De Quervain's Syndrome: inflammation of the tendons on the side of the wrist which move the thumb sideways away from the palm.

Direct costs of injuries: these include worker's compensation, medical/hospital, rehabilitation, dependent pension, legal, etc.

Engineering controls: changes made to workstations, products, tools, machinery, and the work environment that alter the physical composition of a work area or work process.

Epicondylitis: inflammation of the tendon attachments on at the elbow. Medial epicondylitis or golfer's elbow is associated with golf because of the activity of forearm flexion along with forceful rotation of the forearm and bending the wrist at the same time while lateral epicondylitis or tennis elbow is associated with impact or jerky, throwing movements as in tennis.

Ergonomic risk factors or stressors: objective characteristics of the work environment, or job, that affect the demands on the person. The main ergonomic stressors are force, extreme postures, movement (repetition or static efforts), and work environment.

Ergonomics: field of study concerned with finding ways to keep people safe, comfortable, and productive while performing tasks at work and home. In other words, fitting the task to the human.

Extreme postures: postures near the end of the range of motion. Exertion in these extreme or weaker postures will require the muscles to work at a level at or near their maximum capacity, resulting in muscle fatigue.

Force: exertion that the muscles in the body produce in order to perform necessary activities. This force is a critical factor in contributing to occupational injuries and illnesses.

Indirect costs of injuries: these include high turnover, bottlenecks, lost productivity, absenteeism, poor quality, low morale, inefficiency, training/retraining, etc.

MSD signs: objective signs that are noted by an examiner, which could include swelling, redness, loss of range of motion, and/or muscle wasting.

MSD symptoms: subjective symptoms reported by the individual, which could include pain, numbness, tingling, tightness, and/or stiffness.

Musculoskeletal disorders (MSDs): injuries and disorders of the muscles, tendons, ligaments, joints, nerves, cartilage and spinal disc; examples include carpal tunnel syndrome, low back pain, rotator cuff tendonitis, and tension neck syndrome.

Raynaud's or Vibration Syndrome: circulatory disorder that is also called the "white finger syndrome." Symptoms such as pain and whitening of hands and fingers are exacerbated by cold and vibration.

Repetition: when the same motions are performed over and over again, using the same muscle groups.

Static efforts: continuous tensing of muscles, which can cause a loss of circulation to affected muscle fibers and result in localized pain and muscle fatigue.

Tendonitis: inflammation of a tendon usually associated with overuse or rubbing of the tendon against bone.

Tenosynovitis: inflammation of the synovial sheath that covers the tendon. De Quervain's disease is a common tenosynovitis of the thumb tendons resulting from the motions commonly used while typing or using a trackball.

Thoracic Outlet Syndrome: can be caused by several different problems. The thoracic outlet is the route used by nerves and blood vessels to pass from the upper body into the arms. Nerves and blood supply passing through the thoracic outlet may be pinched, which then causes pain and/or numbness down the arm and to the fingers.

Work environment: different factors that affect the way the body works and may increase the likelihood of MSDs. These factors include: cold temperatures, hot temperatures, noise, lighting, vibration, etc.

Appendix

Sample Ergonomics Program

1.0 Purpose

This work instruction defines the steps required to provide a formal structure for the development and implementation of a successful Ergonomics Program at all Company ABC sites.

2.0 Scope

This work instruction applies to all worldwide locations of the Company ABC.

3.0 Responsibility

3.1 Company Leadership:

3.2 Plant Leadership: The Plant Manager is responsible for providing appropriate personnel, resources and financial assistance. Management will assure the Ergonomics Team will have adequate work time to actively participate in all related activities.

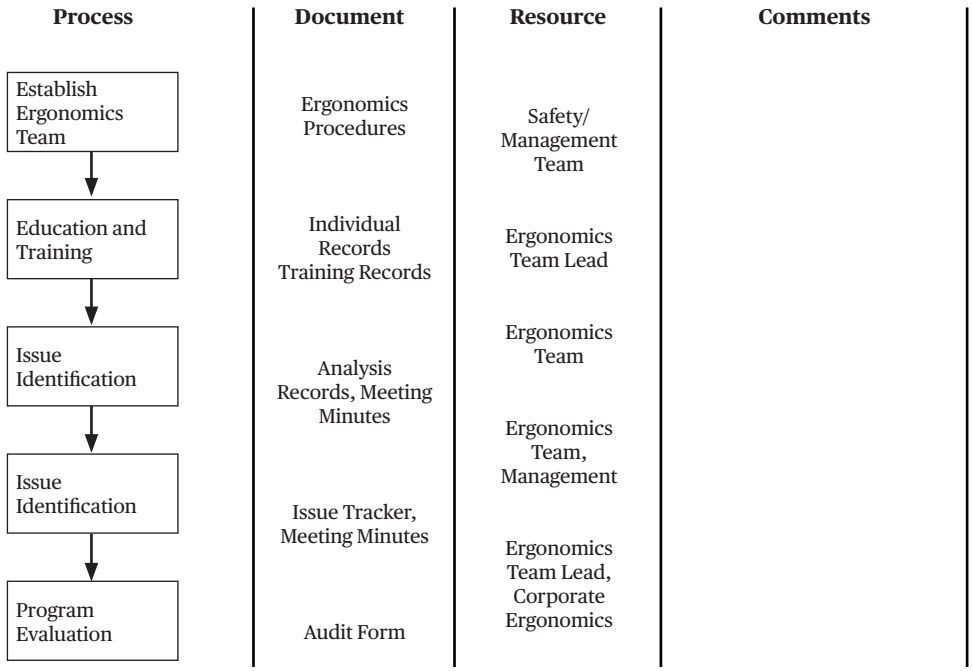
3.3 The Corporate Ergonomics Team is responsible for supporting the site Ergonomics team.

3.4 The Ergonomics Team is responsible for:

- Providing assistance to team members with ergonomic concerns,
- Developing and maintain all job analysis and documenting all open issues (with responsible party and target dates),
- Attending incident investigations regarding potential or diagnosed Cumulative Trauma Disorders (CTDs) or Work-Related Musculoskeletal Disorders (WMSDs),
- Conducting necessary ergonomic training (i.e. new hire, job rotation),
- Assisting in the development of proper job rotation schedules and audit their adequacy at least twice a year,
- Tracking and communicating ergonomic issues to the Health, Safety, Ergonomics and Environmental Committee at each site,
- Submitting monthly reports to the Corporate Ergonomics Team.

3.5 All Employees are responsible for supporting the efforts of the site Ergonomics Team and actively participating in the update and implementation of action plans.

4.0 Process



4.1 Establish the Ergonomics Team:

4.1.1 Definition: The Ergonomics Team is a permanent cross-functional group of individuals formed to promote the ergonomics effort at the site level. An optimal group will include team members from safety, engineering, maintenance, management, human resources, medical, production, materials and quality. The size of the Ergonomics team will vary depending on facility size. An Ergonomics Team Lead will be designated for each Ergonomics Team. It is recommended that the Lead not be the Health and Safety Professional.

4.1.2 Maintaining the Ergonomics Team: Meetings of the Ergonomics Team will occur at least once per month. The Lead at each site will facilitate the meeting. Meetings will be utilized to review and update the status of open ergonomic issues documented by site team members. Newly reported CTDs/ WMSDs (with 8D reports) and trends should be analyzed and discussed to determine areas in need of future ergonomic intervention.

4.1.3 Functions of the Ergonomics Team: The Ergonomics Team will identify, track and resolve Ergonomics issues at the site, according to the Ergonomics Standard Operating Procedure.

4.2 Education and Training

4.2.1 Ergonomics Team: Ergonomics team members will participate in ergonomics training annually, and within six months of joining the team. Training can be internal or external, however the team member must complete at least one internal ergonomics course every two years. The team will also conduct training for new hires, job rotation, and basic ergonomic principles. Basic ergonomic training for all plant employees should be conducted yearly at a minimum.

4.2.2 Management:

4.2.3 Engineering:

4.2.4 Employees: General Awareness training (office or production specific) should be conducted for managers, supervisors, and employees in areas with high levels of ergonomic stressors and/or high rates of WMSDs. This awareness should be taught to all new hires and refreshed for all employees annually.

4.2.5 Documentation: Training shall be documented per company procedures through individual records and/or training records.

4.3 Issue Identification

4.3.1 First Tier Analysis: The First Tier Analysis includes basic but comprehensive forms for the identification, assessment, and prioritization of WMSD risk factors (force, posture, movement, and environmental).

4.3.1.1 Team members shall be trained in use of the analysis tools prior to use.

4.3.1.2 An analysis shall be conducted on all existing jobs annually.

4.3.1.3 The analysis tool results shall be used by the site/department ergonomics team identify and prioritize jobs with potential ergonomics issues. Additional sources may be used to help prioritize jobs/ issues. These include Injury/Illness incidence investigations, Workers' compensation claims, employee reports of problems, jobs with high rates of absenteeism and worker turnover, site healthcare professional observations and jobs with quality and production issues. (Reference documents)

4.3.2 Second Tier Analysis: Once a "high priority" job is identified, the site/department ergonomics team may need a second tier assessment tool to confirm this priority rating. Once verified, the forms should systematically lead the site/department ergonomics team to develop and implement risk elimination/minimization control measurements. The forms should also be used to reevaluate the job post implementation to verify and document the effectiveness of risk reduction process. Second Tier assessment includes more detailed analytical tools such as:

Manual Material Handling Issues
NIOSH Lifting Guidelines
Manual Materials Handling Tables

Repetitive Upper Extremity Issues:
Rapid Upper Limb Assessment (RULA)
Strain Index (SI)
Muscle Fatigue Assessment (MFA)

4.4 Issue Resolution: Actions shall be taken to reduce or eliminate identified risk identified by analysis tools, where economically feasible. The following shall be documented for identified issues:

4.4.1 Control Measures, as applicable: Engineering and/ or Administrative Controls, Short Term and Long Term.

4.4.2 Person Responsible for implementation

4.4.3 Implementation Timing

4.4.4 Follow-up: Issues will be re-evaluated once control measures are in place to determine effectiveness of controls.

4.5 Program Evaluation: The Ergonomics Program at each site will be audited annually by a representative from Corporate Ergonomics. Refer to the Program Audit form. Any non-conformities will be addressed prior to the next audit. An interim audit may be conducted by each site as needed.

5.0 Records/Logs

The Ergonomics Team Meetings and Monthly Report are stored by the Ergonomics Team Lead.

The Training Documentation Records are stored by Human Resources, Training Department, or Instructor.

Job Analysis Records

Issue Tracking Records

Ergonomic Program Audit Records

6.0 References

Analysis Forms

Program Evaluation Audit Form