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# **PARTICIPATIVE ERGONOMIC BLUEPRINT**

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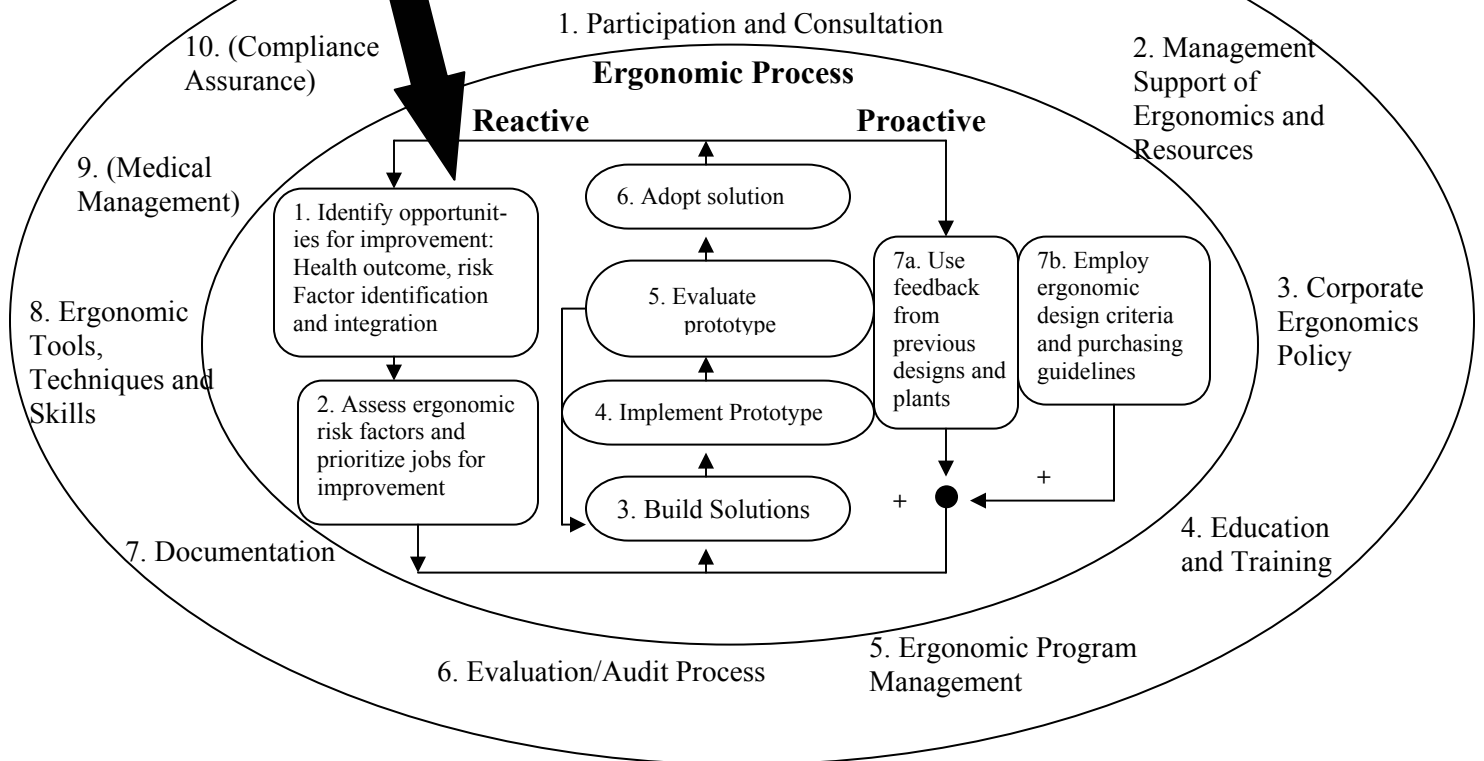
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August 2003

### Start Up

- Establish management support
- Form Ergonomic Change Team
- Initiate basic training

## Health & Safety Process



# FOREWORD

This document presents a participative approach to ergonomic program implementation. It is based on the authors' decade of experience in companies. It has also been informed by the peer-reviewed scientific literature, and by the experience of other colleagues and practitioners. This research was funded by HEALNet (Health Evidence Application and Linkage Network, Canada) and the WSIB-RAC (Ontario's Workplace Safety and Insurance Board, Research Advisory Council).

The Blueprint is a facilitator's guide to implementing a successful participative ergonomics program as part of an organization's health and safety program. It is intended for consultants with health and safety associations (HSAs) who can use the Blueprint to enhance their existing models and organizational change initiatives. It can also be used by workplace health and safety specialists who have some ergonomics background, or by organizational change consultants with a specialization in ergonomics. It outlines Steps, Tips, and Progress Indicators that can help organizations develop the knowledge and skills they need to create a successful and sustained workplace ergonomics program.

It sets the groundwork for establishing management support, setting up a participative ergonomic change team, and initiating basic training in ergonomics. The Blueprint advocates including all those affected by the changes, and believes that a participative approach is more effective and sustainable. It also advocates the support of management to ensure the success of the change initiatives.

The Blueprint has an Ergonomic Process (the inner ring) and a Health & Safety Process (the outer ring).

The Ergonomic Process takes the facilitator through a reactive cycle from identifying risks, evaluating the priorities, proposing solutions, implementing and evaluating a prototype, to adopting solutions. The proactive cycle uses the feedback from previous changes, and ensures that ergonomic principles are used in the purchasing and design of new equipment.

The Health and Safety Process is the organizational structure that supports the Ergonomic Process. The Health & Safety Processes that are highlighted are participation and consultation; management support; corporate ergonomics policy; education and framing; ergonomic program management; evaluation/audit process; documentation; ergonomic tools, techniques and skills; medical management; and compliance assurance.

These processes are common to many organizational change and consulting models, and ensure that the changes developed by the organization are implemented, successful, and sustained.

Although we advocate using the Proactive as well as the Reactive Cycle, and having all the Health & Safety Processes in place, you may choose to use only parts of the Blueprint. For example, if you choose to only use the Reactive Cycle of the Ergonomic Process, you will still find the Steps, Tips, and Progress Indicators useful.

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# INTRODUCTION

This “Blueprint” is intended to help start and sustain an effective Participative Ergonomic Program in your organization to address poor ergonomic quality of work.

## What is Ergonomics?

Ergonomics is human-centred design. It is the process of designing and/or modifying tools, materials, equipment, work spaces, tasks, jobs, products, systems, and environments to match the mental and physical abilities and limitations, and social needs of people. Introducing ergonomics in the workplace facilitates safe improvements in quality, productivity, usability, and profitability of products, processes, and services.

## What is the scope of Ergonomics?

Ergonomics includes interventions aimed at improving work, products and services at both the level of the individual (micro-ergonomics) and at the level of the work organization (macro-ergonomics). Clearly these levels interact with each other.

## Overview

In this Blueprint, the ergonomic process refers to the activities of an ergonomic change team charged with finding the many opportunities for improvement within the working environment with particular emphasis on musculoskeletal disorders.

The overall goal is to improve the ergonomic quality of the work environment. It includes general problem-solving steps such as problem identification, assessment and solution generation, and evaluation using tools and techniques from the field of ergonomics.

- The Reactive Ergonomic Change Process runs through the steps of identification and assessment of risk factors, building, evaluating and adopting solutions for improving existing jobs and processes. Solution Building, Implementation, Evaluation, and Adoption are common features to each step.

- The Proactive Ergonomic Change Process should be incorporated by companies as a long-term goal. It includes using feedback from previous design plans, and employing ergonomic design criteria and purchasing guidelines as a standard part of the process.

- The Health & Safety Process is the infrastructure required for the ergonomic change team to succeed in implementing the ergonomic change process and includes such elements as training, management support, resources etc.

The elements of the cyclic Ergonomic Process are first introduced, followed by the supporting elements of the Health & Safety Process.

- The purpose of each element is introduced followed by a number of steps to achieve the purpose.

- A “Tips” section follows which introduces specific experience from a number of companies. There may be duplication of tips from section to section.

- Finally, a “Progress Indicators” section allows the user to assess the success of the program in achieving its goals. The “No” category in the evaluation indicates that this element requires further work.

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# START-UP OF THE ERGONOMIC PROGRAM

Before an organization commences an Ergonomic Change Process, some preparatory work is needed. This includes obtaining the support of senior management within the organization, forming a participative Ergonomic Change Team, and giving team members basic training.

## Start Up

- Establish management support
- Form Ergonomic Change Team
- Initiate basic training

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## Establish Management Support

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### Purpose:

Establish support to mobilize resources and enthusiasm.

### Steps:

1. Obtain senior management and union support for a successful ergonomics program. This can be achieved in advance, OR by using a small project to demonstrate the goals and scope of ergonomics. Make people in the organization aware of the goals and scope of the ergonomic program.

2. Obtain permission to establish an Ergonomic Change Team (8 to 12 people).

### Tips:

The importance of consistent and clear communications from senior managers and supervisors cannot be overemphasized when trying to solicit support from management and labour. Supervisors should be recruited to assist with communications to, and feed-back from, the workers throughout the improvement cycle. Discussion of the scope, methods and benefits of engagement in an Ergonomic Program should assist in soliciting support from all members of management.

## Progress Indicators

	Yes	No
Senior management support ergonomic program in word and deed		
People in the organization are aware of and support the goals and scope of the ergonomic program		

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## Form an Ergonomic Change Team

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### Purpose:

Establish a Participative Ergonomic Change Team with appropriate skills and broad-based representation across the company.

### Steps:

1. Commit to a participative style of working from the start that allows for the building of trust, listening skills, respectful exchange of ideas, brainstorming new ideas, commitment, accountability, and results orientation.
2. Identify people who are affected by or at risk of ergonomic injuries and illnesses, poor quality, etc. Identify those who can effect change among management and labour, such as production workers, supervisors, organized labour, production engineering, maintenance, etc.
3. Identify an ergonomic champion from top management and a champion within the Ergonomic Change Team.

### Tips:

1. Involve production operators in the improvement process whenever possible. Direct representation on the Ergonomic Change Team, and small group involvement in specific projects are two ways this can be accomplished. This builds a broad base of knowledgeable and interested people for future projects.
2. Rotate the chair of the Ergonomic Change Team.
3. We have found the following job positions to be effective in a manufacturing environment: Manager of Health, Safety & Environment (Corporate), Human Resources Manager (Plant), Lead Hand (Plant), Tooling Manager (Plant), Production Manager (Plant), Union Health & Safety representative (Plant), Maintenance Supervisor (Plant), Quality Assurance (Plant), Process Engineer (Plant), and involved workers.

### Progress Indicators

	Yes	No
The ergonomic program has participation from all appropriate areas of the organization		
The activities of the Ergonomic Change Team reflect a participatory approach to change		
An ergonomic champion is part of the Ergonomic Change Team		

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## Initiate Basic Training/Education

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### **Purpose:**

There is an emphasis on “process” rather than ergonomic training in this Blueprint. But some basic training is needed. Provide initial training to enable the Ergonomic Change Team to perform the core functions of identification and assessment of risk factors, solution building and follow-up assessment.

### **Steps:**

Educate and train the Ergonomic Change Team in ergonomic concepts, tools and

general problem-solving skills. The concept of “root causes” also needs to be discussed and explained.

### **Tips:**

In its early stages, more general education on ergonomics and problem solving will often suffice, but as the “low-hanging fruit” is plucked and jobs are improved, the team will require further training on risk factor assessments to identify the root causes of more difficult ergonomic problems.

## **Progress Indicators**

	Yes	No
The Ergonomic Change Team has received initial training/ergonomic education		

### **Next steps:**

Now that the Start-Up phase has put in place the major components of organizational support, team formation, and initial training, the Ergonomic Change Team can begin the Ergonomic Change Process.



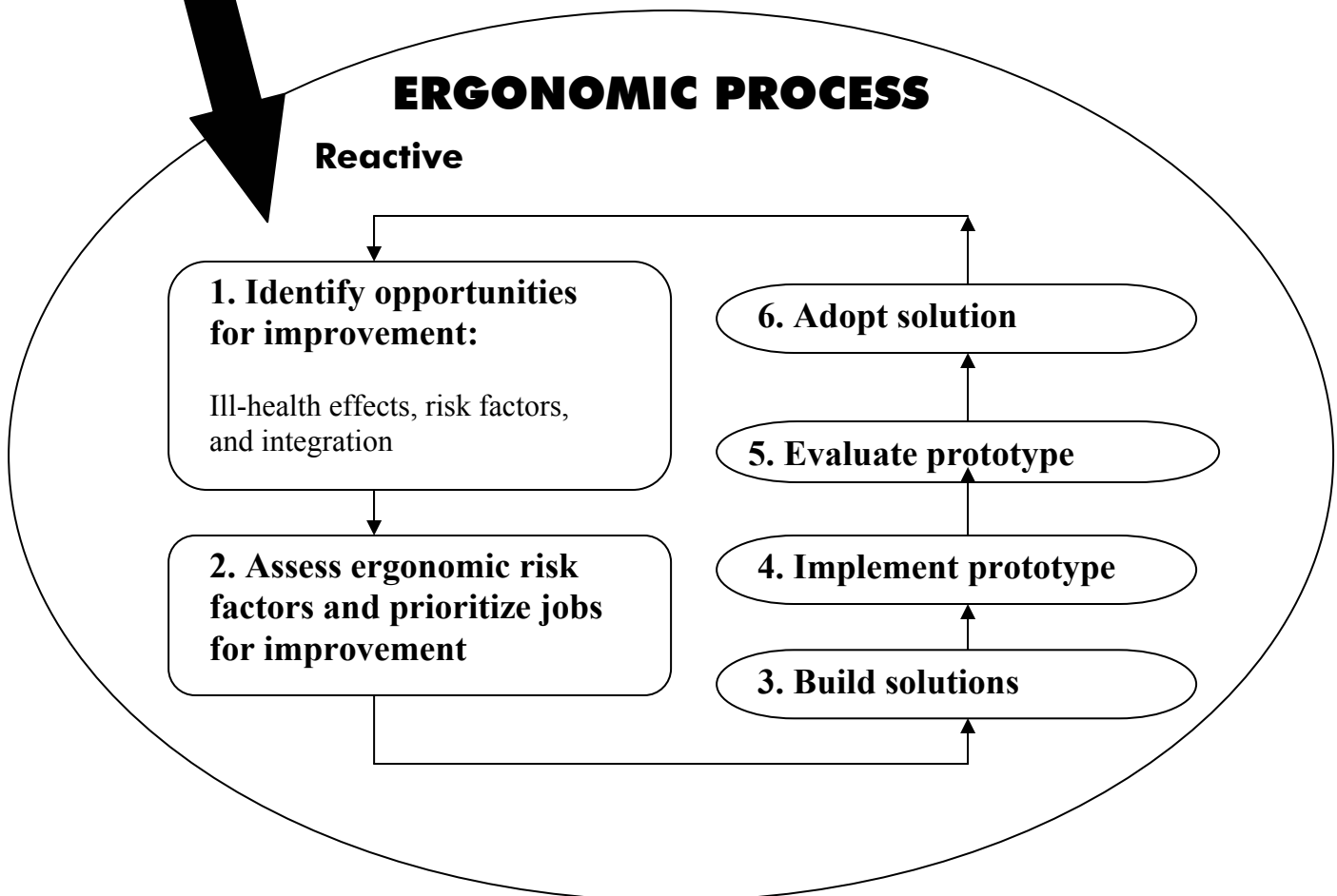
## Start up

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## ERGONOMIC PROCESS

### (REACTIVE)

With the supportive elements of the *Start-up* in place, the Ergonomic Change Team can begin the *Ergonomic Process*. Usually the team begins with the *Reactive Ergonomic Process*. This process addresses the immediate ill-health and other concerns due to poor ergonomics.



# PHASE 1: IDENTIFY OPPORTUNITIES FOR IMPROVEMENT

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## Health Outcomes Identification

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### Purpose:

To identify jobs, tasks or processes in which workers experience elevated rates of musculoskeletal disorders (MSDs) or there are other indicators of poor ergonomic quality.

### Steps:

1. Use WSIB claims (converted to a rate) to identify areas/jobs with high rates and severity of injury and claims (Lost Time and No Lost Time Claims).
2. Use First Aid Log (converted to a rate) to identify areas/jobs with high rates and severity of first aid use.
3. Use organization's injury reports (converted to a rate) to identify areas/jobs with high rates and severity of injury.
4. Use discomfort surveys to identify areas/jobs with high complaints.
5. Use worker and supervisor comments to identify areas/jobs with high complaints.
6. Use information from other sources, such as quality problems, high scrap rates, and high turnover, to identify areas/jobs with poor ergonomic quality.

### Tips:

1. Identifying job-specific health outcomes may require changes in the reporting process to identify problems by area/process.
2. Rates of injury and illness expressed per 200,000 worker hours can be used to compare areas with different numbers of people.
3. The Occupational Health Department may have health outcome information.
4. Discomfort surveys may be used at this stage. However, many advocate using only administrative data (information collected routinely by the organization) at this initial screening stage and reserving discomfort surveys for Phase 2 (assessment).
5. Health and similar outcomes are "lagging indicators"; they document a problem that has occurred. This lag time may be considerable (years) for some indicators.
6. In one study in an automotive assembly plant, most quality problems were associated with poor ergonomic quality of the job.

## Progress Indicators

	Yes	No
Routine (monthly or quarterly) reviews of workers' compensation files for patterns and trends of claims for musculoskeletal disorders are conducted		
Claims data, reported by job or process area, are collected		
Incidence and severity, expressed as a rate, is done		
Jobs or process areas with high incidence of injury, frequencies, and/or costs, can be clearly identified		
Routine (monthly or quarterly) reviews of first aid and medical files for patterns and trends of musculoskeletal disorders are conducted		
The company actively and routinely solicits input from employees about discomfort related to their job using oral reports or discomfort diagrams		

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## Risk Factor Identification

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### Purpose:

To identify jobs/tasks or processes with risk factors for the development of musculoskeletal disorders (MSDs) and poor ergonomic quality of jobs. This is important even if there has not been any particular injury; there may still be a risk.

### Steps:

1. Choose a checklist that addresses risk factors required by your organization's ergonomic policy or regulatory programs (if applicable).
2. Choose a checklist to identify risk factors for injury that is compatible with the type of work e.g., office or manufacturing .

### Tips:

1. Use the "UW Opportunities for Improvement Checklist" or another checklist to identify risk factors by job/task/process.
2. Don't forget that psychosocial factors (a workers' perception of the job) are risk factors for injury quite separate from the physical demands of the job. The "UW Opportunities for Improvement Checklist" identifies some major areas for improvement.
3. Tabulate existing information from Job Safety Analyses, Physical Demand Analyses, if available.
4. Some checklists are very sensitive. They tend to flag many jobs as potentially hazardous when a further examination will show them not to be. Most checklists are designed to be sensitive to avoid missing a job that could be hazardous.

## Progress Indicators

	Yes	No
An appropriate checklist has been chosen and used consistently by trained individuals	<input type="checkbox"/>	<input type="checkbox"/>
An assessment of each job/task/process exists	<input type="checkbox"/>	<input type="checkbox"/>

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## Integration of Health and Risk Factor Information

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### Purpose:

To integrate data from the health and risk factor investigation to determine which jobs warrant further ergonomic investigation and assessment.

### Steps:

Use risk factor and health information to decide which jobs warrant further ergonomic investigation and assessment.

### Tips:

1. Risk factors present + MSD.  
Action: Further ergonomic investigation (Step 2) + Medical Management.
2. Risk factors present + No MSD.  
Action: Further ergonomic investigation (Step 2).
3. No Risk factors present + MSD.  
Action: Further ergonomic investigation (Step 2) + Medical Management.
4. No Risk factors present + No MSD.  
Action: No action at present but continue to track risk factors and health outcomes yearly or upon changes to processes, equipment or products.

5. With small numbers of employees per job, health outcome measures such as medical aids and injuries may be too unstable to be of much use. Use identified risk factors to guide decisions.

6. Recently hired employees may not show ill health outcomes for months or a couple of years, even in the face of high levels of risk factors. Use identified risk factors to guide decisions.

7. High seniority employees may not show ill-health outcomes even in the face of high levels of risk factors. These individuals, perhaps due to some combination of personal factors such as height, have not developed problems while others have “selected out” of this job. A worker moving into this position however, may be adversely affected by such a job. Use identified risk factors to guide decisions.

8. A job may have few identified risk factors, but high rates of injury and disorders. People tend to “self select out” of high demand jobs (see above) and “select into” low demand jobs due to injury. Determine if the injury occurred prior to beginning the job in question.

9. In workplaces with extensive rotation, it will not be possible to identify a particular job/task that produces an injury. Use identified risk factors to guide decisions.

### Progress Indicators

	Yes	No
Risk factors and health information are routinely used to prioritize jobs		
New jobs, modified jobs, and jobs with altered equipment/tools are assessed within 3 months		

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## **PHASE 2: ASSESS ERGNOMIC RISK FACTORS AND PRIORITIZE JOBS FOR IMPROVEMENT**

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### **Purpose:**

To assess jobs identified in the previous step and assess their priority for ergonomic intervention.

### **Steps:**

1. Collate all information from health outcomes and risk factor identification by task/job/process.
2. Identify other problems often related to poor ergonomics, (such as poor quality, scrap, turnover, slips and falls) by task/job/process.
3. Identify subset of task/job/process for further analysis.
4. Use appropriate methods to identify root causes of problems. Appropriate methods have been validated, provide a rating/quantification of hazard and provide diagnostic information for change.
5. Create prioritized list of jobs/tasks/processes requiring change.

### **Tips:**

1. Active involvement in the data collection phase will improve the team's ability to evaluate information in order to determine the best course of action.
2. The team should actively use the "UW Opportunities for Improvement Checklist" when discussing and developing solutions to make sure all injury risk factors are being addressed.
3. If discomfort surveys have not been performed in Phase 1, they can now be used to help identify hazards where the health outcomes of a job are unclear.
4. The team should attempt to identify and focus on 3 to 5 key improvements at a time. Too many active projects diffuses the team's efforts and slows implementation. Workers may perceive this as inactivity by the Ergonomic Change Team.
5. The first job improvements tackled by the Ergonomic Change Team should have a high chance of completion and success.
6. The Ergonomic Change Team may need the advice of a trained ergonomist to help them identify root causes.

## Progress Indicators

	Yes	No
Clear identification of root causes for ergonomic problems are made		
Decreasing backlog of assessments		
Few jobs yet to be assessed		
A thorough analysis of the concern, with documentation on tasks and associated forces, postures, frequencies, energy cost, illumination (as appropriate) and a diagram of site, is provided to help with diagnostic information for change		
Appropriate tools are used which provide a rating/quantification of hazard such as NIOSH, WATBAK4D		
Use a formal, agreed-upon approach to prioritize jobs		
Prioritization uses other indicators of poor ergonomic poor quality such as quality, scrap, turnover, slips and falls		
Prioritization uses medical information such as injury reports or discomfort surveys		
Prioritized list is up to date with clear indication of stage of the solution process and persons responsible		

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## PHASE 3: SOLUTION BUILDING

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### Purpose:

To develop a prototype/trial solution to address the risks identified in the previous step.

### Steps:

1. Get all involved parties around the table.
2. Clearly describe the task/job/process.
3. Explore root causes of problems. Do not self-censor or self-limit, but explore the big picture and explore work organizational factors.
4. Search organizational or outside solutions to the same problems (follow up and go to #6).
5. Brainstorm solutions.

6. Rank feasible solutions on estimated effectiveness (including ergonomic quality), cost, improvement in production/quality and time frame for implementation.

### Tips:

1. Actively involving workers in the development of improvements may improve initial designs; “focus groups” or posted appeals for suggestions are two approaches to engage employees in this stage.
2. Use a table to rank solutions that address root causes, to make it easier to assess.
3. Make sure that the solution you have chosen does not create its own problem.

### Progress Indicators

	Yes	No
All appropriate people in the organization are involved		
A formal agreed process for developing, analyzing and developing solutions exists		
Solutions to problems from other areas of the organization are available to the group		
Solution has engineering involvement and support		
Considers a full range of engineering solutions from quick fixes to automation		
Understands limits of administrative controls and uses them appropriately		
Seeks to use engineering controls for long-term solutions		
Ongoing resources are available for small changes		



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## PHASE 4: PROTOTYPE IMPLEMENTATION

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### Purpose:

Where possible, implement solution on a small scale or proactively as a computer simulation, to judge its ergonomic quality and interactions with other equipment or processes.

### Steps:

1. Give information to people affected by the trial of the prototype before implementation.
2. Implement prototype (if possible off-line) and offer training/familiarization.

### Tips:

1. Implementation or testing of all improvements should be communicated to the workforce. This could be done by posting updates on the Ergonomic Information Board and also communicated through the supervisors and lead hands.
2. Don't test a crude prototype on the line during normal production. It is difficult to recover from an outright rejection even if the design is later improved

### Progress Indicators

	Yes	No
Did workers, supervisors, engineering staff know of and understand the purpose of the trial?		
Enough training/familiarization/removal of production constraints have been conducted to enable a fair trial of prototype		
Planned follow up of all prototype solutions		

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## PHASE 5: PROTOTYPE EVALUATION

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### Purpose:

To estimate the ergonomic quality of the prototype solution(s).

### Steps:

1. Plan evaluation on an appropriate range of people, e.g. size, gender. Be sure at least the extremes of height and weight participate.
2. List all activities performed on the prototype(s) including maintenance, cleaning as well as regular production use. Evaluate situations that are “most frequent,” “most important,” “emergency,” etc.
3. Plan evaluation on appropriate sample of products/variants.
4. Decide on criteria for success including comfort, production, quality, vision, etc.
5. Use formalized feedback from people to assess criteria (discomfort, ergonomic assessment tools, reach distances, ratings, etc.)

6. Proactive evaluation can be performed with mock-ups (wood/cardboard/foam etc.) or computer simulation and evaluation using human mannequins.

7. Decide to move forward for full implementation, or return to step 4 (Prototype Implementation ) with small changes, or step 3 (Solution Building) for re-evaluation.

### Tips:

1. The Ergonomic Change Team should use quantitative assessment tools whenever possible to measure the effectiveness of an ergonomic change.
2. A “1 Minute Survey” should be performed by all workers to make sure all worker opinions are heard and to help document the success of a particular change.
3. This process is called a “user trial” and further methods and tips can be found in the ergonomic literature.

### Progress Indicators

	Yes	No
Systematic use of discomfort/ ergonomic assessment tools/ interviews		
Evaluation of appropriate ergonomic issues, e.g. posture, reach, muscle activation, musculoskeletal loads, vision, illumination, vibration, comfort, worker preference, etc.		
Use of appropriate and widely accepted measures of ergonomic quality of new designs		

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## PHASE 6: SOLUTION IMPLEMENTATION

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### Purpose:

To permit a smooth introduction of the solution after prototype trials.

### Steps:

1. Provide information and training on the solution before adoption.
2. Initiate widespread implementation of the solution.

### Tips:

1. A standardized implementation procedure for ergonomic improvements is required. The solution should not just appear on Monday morning and employees be expected to start at full production.
2. The Ergonomic Change Team should track the implementation times to monitor performance.

### Progress Indicators

	Yes	No
Did workers, supervisors, engineering staff know and agree to the purpose and rationale for the adoption of solution?		
Was training and familiarization with the solution available?		
Were allowances and resources available for fine-tuning under full production situations?		
Were there frequent and routine assessments to judge effectiveness and to avoid additional ergonomic or other problems?		

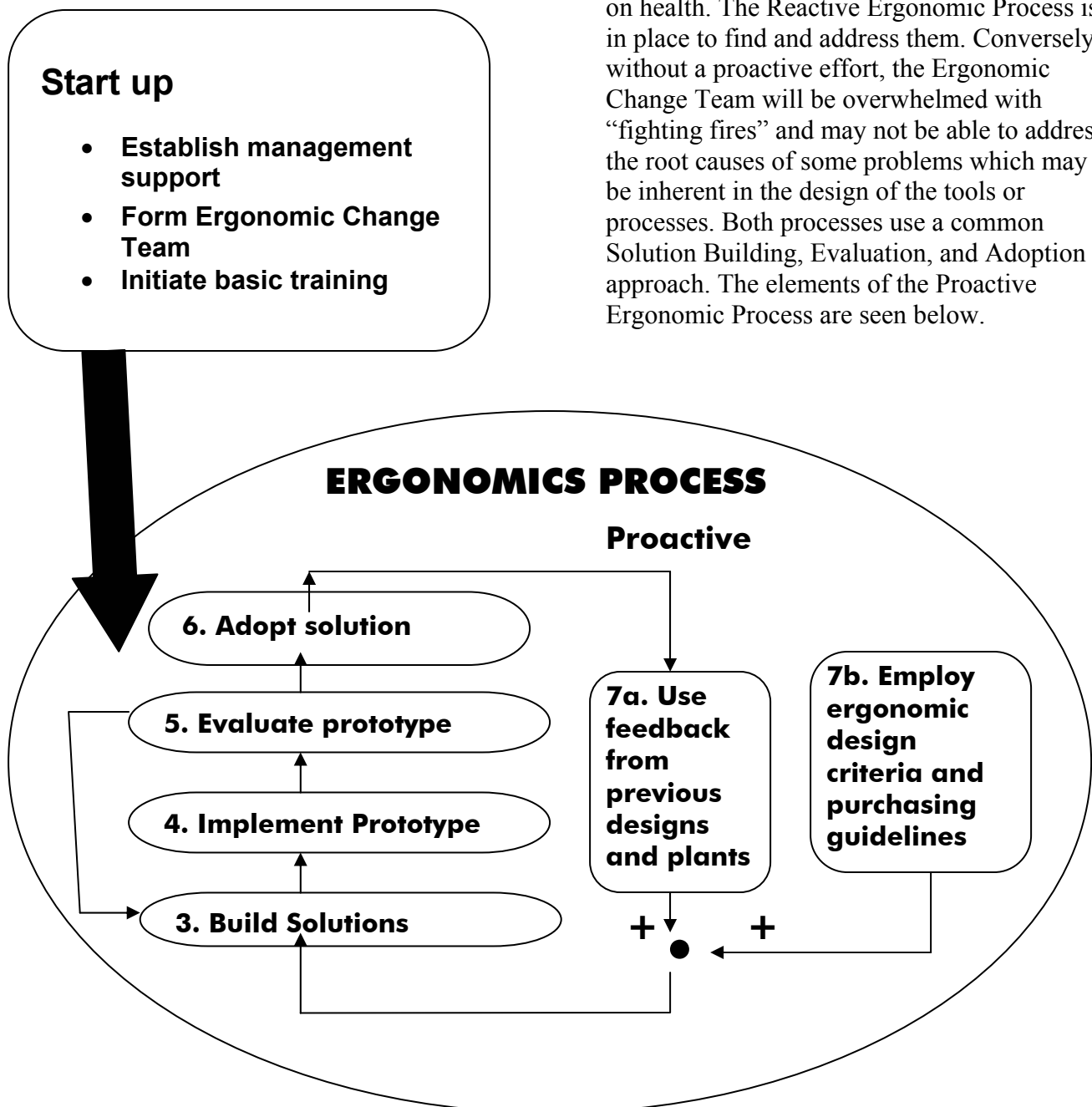
### Next steps:

The continuing effect of the change is monitored by Phase 1: Identify Opportunities for Improvement.

This completes one cycle of the *Reactive Ergonomic Process*. This cycle continues and elements of the *Health & Safety Process*, such as *Management of the Ergonomics Program*, directs the activities.

## ERGONOMICS PROCESS (PROACTIVE)

The Proactive Ergonomic Process aims to address risk factors for injury and the root causes of poor ergonomic quality before they enter the plant as poor tools, job designs processes or equipment. The two processes, reactive and proactive, are complementary and both are required; even designs with extensive ergonomic input may have unintended effects on health. The Reactive Ergonomic Process is in place to find and address them. Conversely, without a proactive effort, the Ergonomic Change Team will be overwhelmed with “fighting fires” and may not be able to address the root causes of some problems which may be inherent in the design of the tools or processes. Both processes use a common Solution Building, Evaluation, and Adoption approach. The elements of the Proactive Ergonomic Process are seen below.



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## **PHASE 7: PREVENTION OF ERGONOMIC PROBLEMS (PROACTIVE APPROACH)**

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### **Purpose:**

To incorporate Best Ergonomic Practice into all new tools, equipment and process designs entering the organization.

### **Steps:**

1. Develop guidelines in all relevant departments to incorporate ergonomic information into decision-making.
2. Use ergonomic tools which allow prediction of the effects of design decisions on human health and performance.
3. Commit resources/time that is needed to incorporate ergonomic information into decision-making.

4. Develop a “future” program that builds in a continuous-improvement cycle of how existing design problems have been improved, and feed this back to the design team.

### **Tips:**

1. Establish a connection to corporate engineering so that the problems identified by the Ergonomic Change Team are improved in future line-builds.
2. Establish a connection between the Ergonomic Change Team and the product design processes, and other design processes so that pro-active ergonomics can be practiced
3. Develop channels of communication with other ergonomic teams, corporate engineering, sales, and senior corporate managers to share new improvement projects and ergonomic issues/concerns.

## Progress Indicators

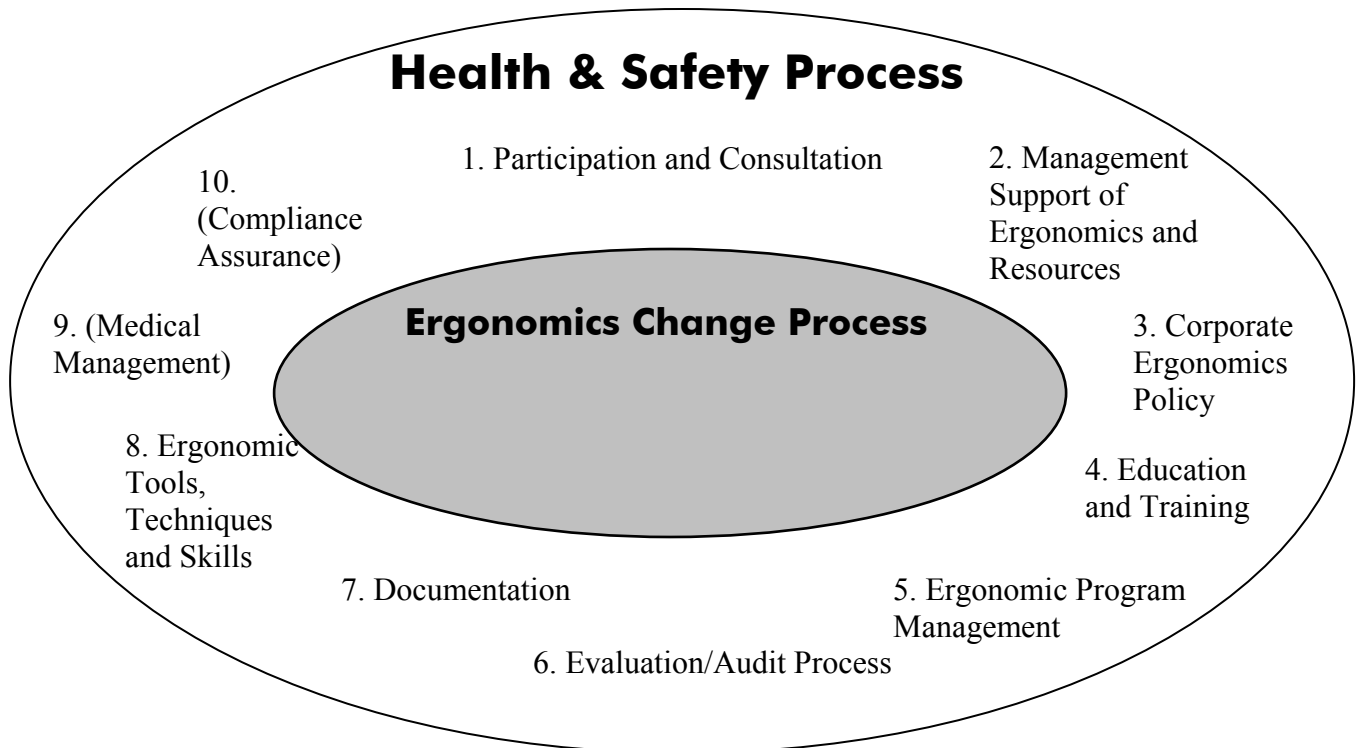
	Yes	No
Relevant departments have identified opportunities available through ergonomics, e.g. purchasing guidelines etc.		
All new or redesigned jobs, tools or equipment are reviewed to identify potential ergonomic problems		
The design of a product or process is always evaluated for its ergonomic consequences; injury, poor quality etc		
Designers and engineers are aware of organizational design guidelines		
People are a primary design consideration		
The design process incorporates ergonomic aspects in conceptualization, preliminary design, procurement, construction, start up and maintenance		
Designers have information in a convenient form and tools available to judge the ergonomic consequences of their decisions		
Reactive ergonomic fixes are decreased because the philosophy is to do it right first time		
Solutions to problems from other areas and current processes in the organization are available		

For Phase 3 to Phase 6 in the process please see the Reactive Ergonomics Process

Both proactive and reactive aspects of the *Ergonomic Process* have now been described. These describe the steps, tools and decisions required to improve the ergonomic quality of work. These activities require support, management and resources if they are to be effective and sustainable. We term the elements required to make the Ergonomic Process effective and sustainable *the Health & Safety Process*. These elements are described next.

# HEALTH & SAFETY PROCESS

The *Health & Safety Process* comprises the elements that the company should have in place to make the Ergonomic Change Process effective and sustainable. These elements are shown below.



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# 1: Participation and Consultation

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## Purpose:

To involve all appropriate personnel in the organization to maximize the effectiveness of the ergonomics process.

## Steps:

1. Commit to a participative working style.
2. Establish a formal strategy and process for clear and continuous communications with all workers across all shifts.
3. Post minutes from the Ergonomic Change Team meetings on an “Ergonomic Information Board.” Also distribute them to plant and corporate management representatives as documentation of a functioning ergonomic program.
4. Open channels of communication with relevant groups within the organization, such as Engineering, Human Resources, Purchasing, Maintenance, Sales.

## Tips:

1. A separate strategy may be needed to handle each stage in the process (problem identification, solution building, testing). Supervisors, lead-hands, and workers on the floor could be recruited to assist with this.
2. Communication is very important. If suggestions are made, some kind of immediate response is necessary. So is follow-up. If a problem requires longer-term follow-up then the individual who made the suggestion should be kept informed.
3. Notify workers when ANY change is being tested so that their feedback can be solicited.
4. Use a “1-Minute Survey” on each shift to get worker feedback.
5. New channels of communication with other ergonomic teams, corporate engineering, sales, and senior corporate managers should be developed to share new improvement projects and ergonomic issues/concerns.

## Progress Indicators

	Yes	No
The ergonomic program has participation from all appropriate areas of the organization		
The activities of the Ergonomic Change Team is known and supported by staff		



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## 2: Management Support of Ergonomics and Resources

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### Purpose:

Demonstration by word and deed that person-centred design (ergonomics) is an integral part of achieving the objectives of the organization.

### Steps:

1. Include ergonomics in organizational decisions.

### Tips:

1. A small operational budget given to the Ergonomic Change Team to implement many low-cost changes quickly is demonstration of support.

2. The management team should request ergonomic updates in their regular meetings until the program has demonstrated sustainability.

### Progress Indicators

	Yes	No
Upper management support for the ergonomic program has been demonstrated to managers and supervisors and staff by word and deed		

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### 3: Corporate Ergonomics Policy

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#### **Purpose:**

To define a clear long-term vision for ergonomics within the organization

#### **Steps:**

1. A long term vision for ergonomics has been created as a written corporate ergonomics policy

2. The corporate ergonomic policy is supported and disseminated by top corporate and site management.

#### **Tips:**

1. Modeling the ergonomic policy and procedures on related policies such as safety, environment or quality improves acceptance.

#### **Progress Indicators**

	Yes	No
A long term vision for ergonomics has been created as a written corporate ergonomic policy		
The corporate ergonomic policy is supported and disseminated by top corporate and site management		
The policy recognizes both health and safety, regulatory and business issues		
The policy has reactive and proactive components		

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## 4: Education and Training

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### **Purpose:**

To educate and train all employees to an appropriate level in the consequences of poor ergonomic quality, identification of risk factors, and their place in the ergonomic process.

### **Steps:**

1. Educate all personnel on identification of symptoms of MSD and other consequences of poor ergonomic quality, and the identification of risk factors and their place in the ergonomic process.
2. Educate and train the Ergonomic Change Team in ergonomic concepts, tools and general problem solving skills.
3. Educate the engineering staff on ergonomics in the design process and on corporate

ergonomic design criteria.

### **Tips:**

1. In its early stages, more general education on ergonomics and problem solving will often suffice but as the “low-hanging fruit” is plucked and jobs are improved, the team will require further training on risk factor assessments to identify the root causes of more difficult ergonomic problems.
2. Be sure that engineering staff can apply the general design criteria to specific design situations and have convenient access to relevant (e.g. anthropometric or strength) data.
3. The Ergonomic Change Team should have a mechanism to have new members trained.

## Progress Indicators

	Yes	No
Employees at all levels can provide a description of the goals and concepts of ergonomics citing relevant examples		
Ergonomics is highlighted in organizational publications		
Ergonomics is a regular topic at Health and Safety meetings		
Employees at all levels receive specific training for their particular jobs		
Employees at all levels are aware of the classic ergonomic risk factors and how to minimize their impact		
Managers and supervisors have received training on the goals and concepts of ergonomics and the implications of ergonomics for jobs in their area		
Upper management support for the ergonomic program has been demonstrated to managers and supervisors by word and deed including attending and participating in training and education sessions		
The Ergonomic Change Team has received initial training and periodic updates and refresher training		
The Ergonomic Change Team is allowed to attend corporate and outside meetings to present their work and network with other such teams		
Training has included both technical aspects (risk identification) as well as managerial aspects (planning etc)		
The organization has access to ergonomic expertise who can apply ergonomics to all aspects of human health and performance		
The organization has access to (internally or externally) advanced assessment tools for assessing jobs and new designs where the expertise or experience of the local Ergonomic Change Team is insufficient		

## 5: Ergonomic Program Management

### Purpose:

To set goals for the ergonomic program and assess achievement of these goals

### Steps:

1. Use the corporate ergonomic policy to guide the activities of the Ergonomic Change Team.
2. Create a detailed list of work activities for the Ergonomic Change Team for the next period.
3. Obtain necessary staff and financial support.

### Tips:

1. Accomplishment in ergonomics should be part of regular staff performance evaluations

to encourage interest in, and support for, an Ergonomic Process.

2. The Ergonomic Change Team should appoint an ergonomics coordinator with specific responsibilities of establishing regular meeting schedules, recruiting help when needed, and assigning tasks such as minute taking, change development, conducting surveys, report writing etc.

3. A standardized implementation procedure for ergonomic improvements is required.

4. Minutes from the Ergonomic Change Team meetings should be posted to the 'Ergonomic Information Board' and distributed to plant and corporate management representatives as documentation of a functioning ergonomic program.

### Progress Indicators

	Yes	No
There is a specific detailed list of work activities for the Ergonomic Change Team for the next period including prioritized jobs		
Necessary staff and financial support has been approved and is available		
Outside support is approved and available for assessing jobs and new designs where the expertise or experience of the local Ergonomic Change Team is insufficient		
The plan is closely followed		
The Ergonomic Change Team has routine scheduled meetings and members attend routinely and actively		
Has a sign-off procedure for implementing solutions and removing them from the "action" list		
Additional staff can attend the meetings for their specific input		
The Ergonomic Change Team reports to the Joint Health and Safety Committee and submits quarterly reports to that committee		
A senior management sponsor or champion meets with the committee		
A list of prioritized problem jobs, with action items, timelines and individuals responsible is maintained		

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## 6: Built-in Evaluation/Audit Process

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### Purpose:

To track the status of the ergonomic program and achievements of its goals.

### Steps:

1. Build in an evaluation procedure during the planning stage for important aspects of the program (management, legislative etc).
2. Produce documentation appropriate for these purposes .

### Tips:

1. The Ergonomic change team should establish a formal sign-off procedure once a solution has been fully adopted.
2. The extent to which an ergonomic change reduces injury risk factors should be quantified using at least one assessment tool
3. Track a range of measures from process measures such guidelines in place, number of jobs assessed, number of solutions tested and implemented, to short term outcomes such as reduction in risk factors, worker comments, to lagging indicators such as first aid reports, WSIB claims etc.

### Progress Indicators

	Yes	No
A clear pattern of control of injuries and disorders and other indicators such as quality, attributable to poor ergonomic quality is evident		
Prevention of risk to health and degradation of performance is well established both proactively and reactively		
The ergonomic program has been routinely found to improve business performance (quality, reduced injury)		
Walk through audits for jobs with ergonomic problems are routine		

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## 7: Documentation

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### Purpose:

To document the goals, activities and outcomes of the Ergonomic Change Team for the purpose of program evaluation, compliance assurance and program management.

### Steps:

1. Create the minimal documentation to address the goals of program evaluation, compliance assurance and program management.

### Tips:

1. The Ergonomic Change Team should continue on the good work established in the Action Improvement Log by specifically tracking the number of projects which are “open”, as well as the phase of the project (e.g. “Development”, “Implementation” or “Evaluation”).
2. Every ergonomic change made (at any plant) should be documented with a brief report summarizing the purpose, and benefits of the ergonomic change
3. An electronic catalogue/database including each of these reports should be created for corporate distribution and retrieval
4. Minutes from the Ergonomics Change Team meetings should be posted to the ‘Ergonomic Information Board’ and distributed to plant and corporate management representatives as documentation of a functioning ergonomic program.

### Progress Indicators

	Yes	No
Does the documentation support program evaluation, compliance assurance and program management?		

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## 8: Ergonomic Tools, Techniques, and Skills

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### Purpose:

To enable members of the organization to assess the ergonomic quality of existing and proposed designs by identifying risk factors, assessing risk factors and evaluating prototype designs

### Steps:

1. Confirm that the Ergonomic Change Team members have appropriate tools (methods/software and training) to identify root causes of problems.
2. Confirm that the design team has ergonomic tools (methods/software and training) which allows for prediction of the effects of design

decisions on human health and performance.

### Tips:

1. A number of checklists and software packages are available.
2. Simple qualitative assessment tools and pencil and paper checklists, will often suffice in the early stages of a program but as the “low hanging fruit” is picked, more complex problems and evaluation of new design will require new tools and training of the team.

### Progress Indicators

	Yes	No
Designers have available information and tools (methods/software and training) to judge the ergonomic consequences of their decisions		
Ergonomic Change Team members have appropriate tools (methods/software and training) to identify root causes of problems		



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## 9: Medical Management

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(This is usually a component of an ergonomic program in the USA but not in Canada. The ergonomic program should, however, maintain links with health care professionals and return-to-work programs).

### **Purpose:**

To integrate workplace changes into the return-to-work policy of the organization.

### **Steps:**

1. The responsibilities of the Ergonomic Change Team are clearly laid out in return-to-work issues.

### **Tips:**

1. Return to work is faster and more effective when workplace changes are integrated within a return-to-work policy.

2. The Ergonomic Change Team can easily spend a majority of its time involved in return-to-work issues. While involvement is appropriate this is not the prime responsibility of the team.

### **Progress Indicators**

	Yes	No
Does the Ergonomic Change Team have involvement with health care professionals and return-to-work programs?		
Are the responsibilities of the Ergonomic Change Team clearly laid out in return-to-work issues?		

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## 10: Compliance Assurance

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### **Purpose:**

To document that the organization is in compliance with a legislated and/or corporate ergonomic program.

### **Steps:**

1. Determine what activities are required to assure compliance with regulations and legislation in ergonomics.
2. Determine what documentation is required to assure compliance with regulations and legislation.

3. Create a process to maintain up-to-date records for inspection purposes.

### **Tips:**

1. The ergonomic program described here is designed to assure compliance with legislated ergonomic programs. However, the particular legislation must always be consulted.
2. Legislation in ergonomics is frequently process oriented, i.e. a company must be able to document that the process steps, risk identification, risk assessment and hazard control, are being followed; documentation must therefore show the timing and extent of these steps.

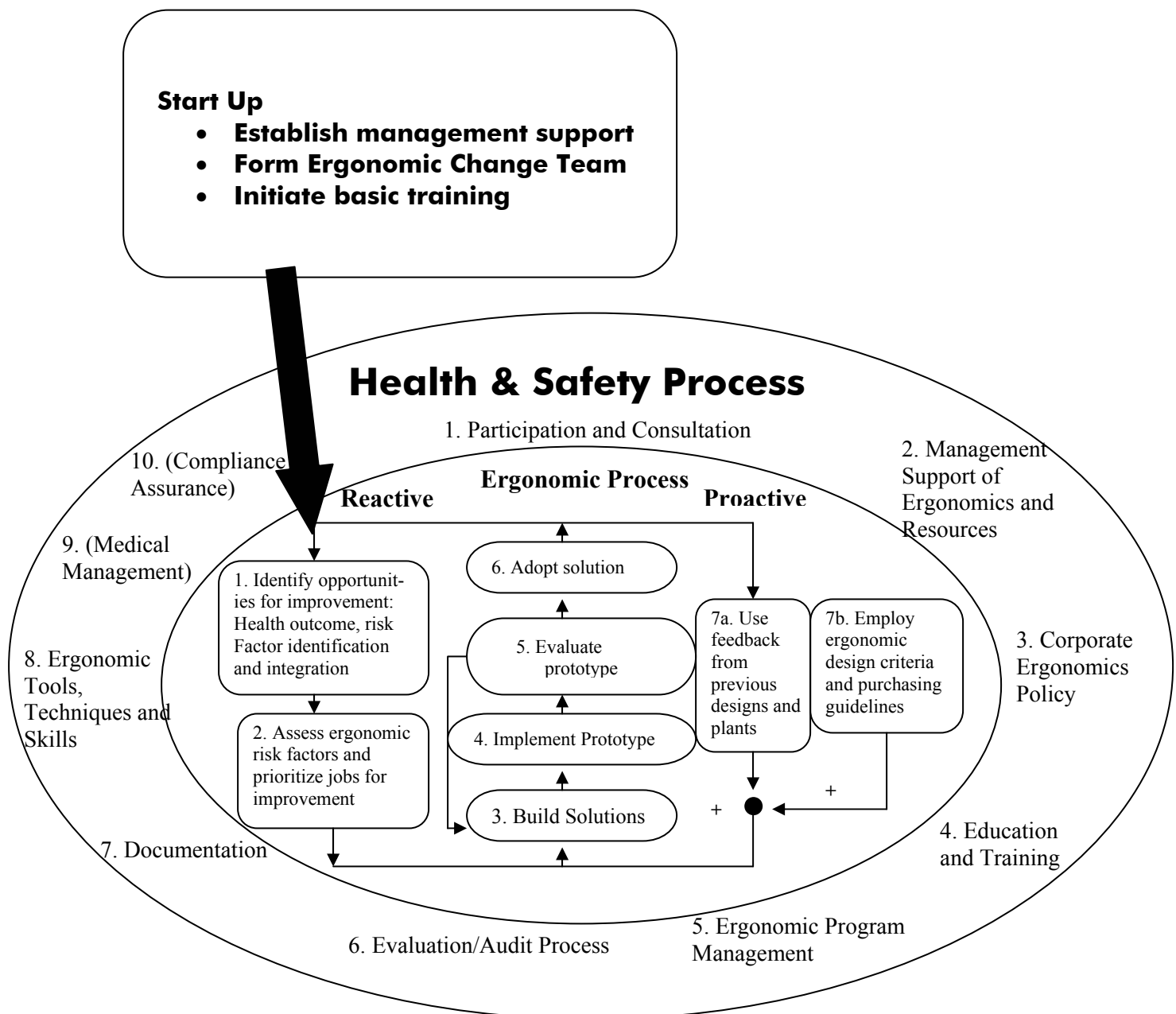
### **Progress Indicators**

	Yes	No
Documentation that demonstrates compliance with legislated ergonomic programs is available for inspection and is up-to-date.		

## Summary

We have now seen all the elements of an effective and sustainable ergonomics program, piece by piece. The figure below shows all the elements of a *Participative Ergonomic Blueprint*, including the *Start-Up*.

In the document we have treated the as a stand-alone activity in an organization. Ultimately the functions of the Ergonomic Change Team are taken over by the organization, and incorporating human-centered design (or ergonomics) into work becomes the usual way of doing business.



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