Implementing an Ergo-Team Approach to Participatory Ergonomics

Training Workbook and Tools for Ergo-Team Members

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How to Implement an Ergo-Team Approach to Participatory Ergonomics

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PREFACE:
Note to Ergo-Team Facilitating Ergonomist

This *Training Workbook* is designed to be used in conjunction with the companion guide document for ergonomists entitled "*How to Implement an Ergo-Team Approach to Participatory Ergonomics.*" The User's Guide is a background document for use by the ergonomist and should be carefully studied prior to initiating an Ergo-Team and prior to using this Workbook.

This Workbook is for use with Ergo-Team members and contains a set of activities and linked tools organized into training modules. The training modules in this Workbook prepare the Ergo-Team for steps 4-22 on the ***Ergo-Team Framework*** outlined in **"How to Implement an Ergo-Team Approach to Participatory Ergonomics"** (Section 4.0).

At the beginning of each module in the Workbook, we identify which groups require the knowledge contained in the module in order for the program to work. There are several training modules that all Ergo-Team members should complete. There are others that are designed for completion by only the worker investigators. Full and appropriate participation is obviously ideal because of the different expertise and knowledge of team members and because this will ensure that most team members share the expertise required for an effective intervention. Comprehensive training of as many team members as possible also helps to protect against turn-over on the team.

The Workbook training modules are designed to allow training to occur over a number of 1 to 2 hour sessions. While in some cases it is possible to do more than one module in a session, we strongly recommend that training not be concentrated in one long session. Shorter sessions have two advantages: 1) they are more likely to result in better learning; and, 2) they may reduce the training-related interruption of normal work operations.

We encourage you to adapt this Workbook and accompanying materials into an information package specific to your Ergo-Team members; we leave it up to you to decide which information to offer them, and in what form. The activities contained in this Workbook and the linked tools are designed for use in a broad range of enterprises. However, we are aware that production processes and workplace culture can vary from enterprise to enterprise and thus these tools may not always be appropriate for all of the enterprises you are working in. Furthermore, there may be tools and activities not included in this Workbook that would be more appropriate for use in those contexts. You are encouraged to integrate these additional materials into your approach but we think it is important to ensure that your training includes all or most of the stages outlined in our implementation program and the broad learning objectives outlined at the outset of each module in this Workbook.

Wherever you are doing your work, we would like to remind you that the development of an Ergo-Team will require that team members have the time away from their work necessary to undergo training, to identify areas for intervention, to do the job analysis, carry out the intervention, develop a report to the joint occupational health and safety committee (JHSC), help present that to upper-level management, and carry out an evaluation of the effectiveness of the resulting changes. Furthermore, the Ergo-Team will need access to space within the enterprise for training, meetings, and for secure storage of confidential materials. They will need support from the facilitating ergonomist throughout at least one full cycle of activity from training through to evaluation. That support will be necessary not only at the level of the team but at the level of management and the enterprise as a whole.

The Ergo-Team is not a replacement for consultation with an expert ergonomist. Once trained, the team can help to drive projects, maintain support and direction of interventions, and make adjustments; but an ergonomist will be required periodically to help the team deal with more complicated issues, update training, and provide guidance.

MODULE 1:
What is an Ergo-Team?

❖ Learning objectives:

1. Know the ergonomist's role in an Ergo-Team PE Approach
2. Know why it is important to have a joint worker-management Ergo-Team
3. Know the duties of an Ergo-Team
4. Understand the main elements of a step-by-step Ergo-Team Implementation Framework as well as the knowledge and activities associated with each step

❖ Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics"* User's Guide:

3.2 The Facilitating Ergonomist

3.3 The Role of Owners and Upper Level Management

3.4 Engagement of Relevant Workers and Supervisors

4.0 The Main Elements of an Ergo-Team Approach to PE

5.0 The Job of the Ergo-Team

The role of the ergonomist in the Ergo-Team PE process

Explain to the Team members that the role of the ergonomist is to build ergonomics capacity in the enterprise by:

- providing essential training to Ergo-Team members
- guiding the Ergo-Team through each of the steps required for their first and if necessary second successful intervention
- helping the Team members communicate the results of their work to key enterprise personnel
- helping the Team evaluate the intervention process and outcomes of their first intervention(s) and,
- providing ongoing but reduced advice and support to the Ergo-Team in future interventions, and working with the Ergo-Team on more complex problems in the future.

Why a joint worker-management Ergo-Team?

Explain to the members of the Ergo-Team that:

1. The presence of both managerial and employee representatives on the Ergo-Team:
   - can give the Team a voice at all levels of the company
   - increases the quality of the Ergo-Team's work and the likelihood that their proposed solutions will be implemented and,
   - promotes the exchange of information about Ergo-Team work and its results throughout the plant.
2. It is wise to include maintenance staff on the Ergo-Team because these individuals are responsible for implementing changes; they have knowledge of how the changes will impact the other workstations and work organization.

Review the ***Duties of an Ergo-Team*** handout with the team.

Steps in an Ergo-Team implementation program

Review each of the steps involved in an ***Ergo-Team Framework*** and explain why a step-by-step process is required.

Explain to the Ergo-Team members that all the information on how to complete each of these steps and tools for each step are included as part of this workbook.

MODULE 2:
Confidentiality Agreements and General Orientation in Ethics and Privacy

❖ Learning objectives:

1. Know the meaning and importance of:
    a. full disclosure
    b. prior and informed consent
    c. maintained consent
    d. privacy and confidentiality
2. Emphasize the importance of confidentiality and steps to protecting confidentiality

❖ Activities

√ Review the **Ergo-Team Confidentiality Agreement**
√ Review some ethics scenarios; discuss as a group
√ Sign the *Investigator's Confidentiality Agreement*

❖ Related sections of the "How to Implement an Ergo-Team Approach to Participatory Ergonomics" User's Guide:

5.1 Confidentiality Agreements and General Orientation in Ethics and Privacy

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Ethics in workplace investigations

Use the ***Ethics for Workplace Interventions by Ergo-Team Personnel*** handout and review with the Ergo-Team members:

- full disclosure
- prior and informed consent
- maintained consent
- privacy and confidentiality.

Activity 1: Confidentiality Agreements

Distribute the ***Ergo-Team Confidentiality Agreement*** and explain to the members that this agreement represents their pledge to plant management to complete Ergo-Team activities while following ethical guideline.

- √ There are privacy and ethical issues associated with most phases of the Ergo-Team process and these should be addressed before the start of any intervention.
- √ The purpose of the confidentiality agreement is to ensure that members agree that any information collected about the health and work habits of individuals during the Ergo-Team activities is only used for the purpose of the Ergo-Team's work and only made public with the consent of the participating employees.
- √ It is essential to revisit this agreement and your ethics training on an annual basis to refresh the Ergo-Team's awareness of these issues.

Activity 2: Ethics Scenarios (Videos)

Discuss the following scenarios as a group:

Scenario 1: Full Disclosure	***Answer***
Scenario 2: Free and Maintained Consent of the Participant	***Answer***
Scenario 3: Privacy of Personal Information	***Answer***
Scenario 4: Protection of Confidential Information	***Answer***

Activity 3: Signing the Confidentiality Agreement

- √ Have the members sign the Ergo-Team ***Ergo-Team Confidentiality Agreement*** if they wish to remain a part of the Ergo-Team.

MODULE 3:
Identification of Potential Areas in Need of Ergonomic Analysis and Intervention

❖ **Learning objectives:**

1. Know how to use various information sources to select intervention sites
2. Understand the strengths and weaknesses of the various information sources

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.3 Identification of Areas in Need of Ergonomic Analysis and Intervention

5.4 The Intervention Process

Explain to the Ergo-Team members that there are many methods available to select projects at the plant. Review ***How to Select Areas for Your Interventions*** with the team.

After completion of the first intervention, other considerations need to be taken into account when prioritizing other areas. These considerations are discussed in detail in ***Module 12*****.**

MODULE 4:
The Body Discomfort Survey: A Tool for Identifying Intervention Sites

❖ **Learning objectives:**

1. Learn how to administer a Body Map Survey
2. Understand how to manage and analyze body map data

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.3 Identification of Areas in Need of Ergonomic Analysis and Intervention

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Body surveys

Explain to the Ergo-Team that one tool commonly used to identify areas of the plant where employees are at higher risk of developing WMSDs is a ***Body Map Survey***.

- On the survey, employees are asked to indicate the area of the plant where they work and to list any particular tasks, or movements within a task, which result in pain.
- They are also asked to list on a body map any sites where they experience pain and fatigue, both while they work and after work.
- The body discomfort survey can also include questions asking the respondent whether they have any ideas or suggestions about how their work might contribute to their pain and/or fatigue, and if they have any suggestions for ways to reduce the problems.
- Answers to these questions can tell the ergonomist and the Ergo-Team about the level of discomfort in different departments and the body areas most likely to be affected. They will also provide important information about participants' views on the causes of WMSDs and signal some things the Team should keep in mind when doing their job analysis and developing recommendations for changes to the Joint Health and Safety Committee and, with them, to upper level management.

Review ***Using the Body Map Survey in your Ergo-Team Project*** with the Ergo-Team.

MODULE 5:
Volunteer Recruitment and Worker Interviews

- ❖ **Learning objectives:**

1. Understand proper ways to recruit employee volunteers
2. Understand how to attain participant consent
3. Understand which type of questions to ask in an employee interview
4. Understand how to complete an effective interview

- ❖ **Activities:**

√ Administering a mock consent form
√ Developing an interview script

- ❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.1	Confidentiality Agreements and General Orientation in Ethics and Privacy
5.4.1	Recruiting Volunteers for Pre-video Interviews and/or Group Discussions with Area Workers and Supervisors
5.4.2	Conducting Pre-video Interviews and/or Discussion

Recruiting employee volunteers

Explain to the Ergo-Team members:

- Once the area in which the intervention will take place is chosen, volunteer participants need to be recruited.
- The Ergo-Team should talk to all the workers from the area and explain exactly what will take place (interviews, video recording, etc.) and roughly how long the investigations will take (previously approved by management).
- They should then ask for volunteers to approach one of the Ergo Team members if they are interested.
- It is important that you do not place pressure on the employees to volunteer. They have an opportunity to choose to participate under their own free will, as discussed in Module 2.
- Multiple employees from the work site should be selected for interview and assessment to ensure that the information gathered is not tailored to only one individual.

- Some consideration should be given to having participants representing both genders, and who have a variety of statures, employment history/seniority, age, pain prevalence, and job skill to ensure the information is representative of the worker population.

- The involvement of the volunteer participant assures the Ergo-Team's observations and recommendations are consistent with the day-to-day operations and are acceptable by all employees. These volunteers will also take part in the implementing changes in their work area, trialing these changes, and providing feedback.

Gaining participant consent

Explain to the Ergo-Team members:

- Ethics remains an ongoing process in an Ergo-Team intervention
- Before beginning an interview, employee volunteers must be told about the activities they will be asked to be involved in:
    1. pre-video recording interview about their work and work environment
    2. recording a video of them doing their job
    3. post-assessment interview to go over the results of the assessment
- Volunteers must also be aware that they are free to leave the intervention project at any time.
- The Ergo-Team investigators must talk with the volunteer participants to ensure they understand who will have access to the information that they provide, and to ensure that they understand that they are under no obligation to continue their involvement and they may withdraw in the future without any negative consequences.
- The participants should know that during an interview any information that is disclosed that does not relate to the Ergo-Team's intervention will *not* be recorded or passed on, as doing so will have no purpose. For example: medication they use, medical conditions not directly related to their work, such as cancer, cardiovascular disease, etc.
- Only worker investigators on the Ergo-Team are involved in the interview process and actual job analysis. This will ensure that volunteer participants feel they can be more open about their concerns about their job.
- The management members of the Ergo-Team will have an opportunity to view the digital recording of the volunteer participant doing their job so that they can have input into the job analysis, but no one outside of the Ergo-Team will have access to the video recording without the participant's consent.
- Any documents containing information that has been gathered from the volunteer participant will be stored in a locked filing cabinet to which only the employee members (Ergo-Team Investigators) of the Ergo-Team have access.
- Volunteers should be aware that only summaries of the information gathered will be shared with other members of the Ergo-Team by the worker representatives.

The consent form

- One way to ensure that the volunteer participant(s) understands all of this information is to have the Ergo-Team members and the volunteers review an informed ***Consent Form***.
- If there are no concerns about literacy, the volunteer participant should be given an opportunity to read through the consent form carefully. If there *are* literacy concerns, the form or script should be read aloud to the volunteer participant.
- The participant should also have opportunities to ask questions.
- If they agree to take part then they should be asked to sign the consent form (as well as initial each individual page), which should also be signed by the Ergo-Team members. A copy should be given to the volunteer participant and one retained by the Ergo-Team for their files.

Activity 1: A mock consent process

√ Give the Ergo-Team members (the investigators) a period of time to read and become familiar with the informed ***Consent Form***.

√ When they are ready, have them do a mock consent session with the ergonomist. The ergonomist should play the role of the employee volunteer and the investigators should explain the project and the consent form.

√ The ergonomist should provide feedback to the employees following the session on ways to improve their skills.

√ This process can be repeated multiple times if the investigators require more practice to become comfortable with the process.

Developing an interview script

Explain to the Ergo-Team members:

- Gaining as much information as possible from the volunteer participants will ensure greater involvement and satisfaction of the employee group.
- An initial interview with the volunteer participant can help to develop a good partnership between the Ergo-Team Investigators and the volunteer participant.
- The interview serves as a way for the Ergo-Team Investigators to gain knowledge related to the work organization, work station environment, and psychosocial factors involved in the work.

- The employee can help to identify the key issues to address in the ergonomic analysis and identify things that should be included in the recommendations to improve acceptance among the employees.
- **However, the Ergo-Team Investigators must carefully pose questions to ensure they get open-ended answers that reveal the information they seek; they must avoid asking questions that can be answered with a simple 'yes or no' from the participant**
- The Ergo-Team Investigators will no doubt have visited the workstation that is being assessed many times in the past; they will already have a variety of questions about how the employees of the area perceive their work, workstation, and environment.
- When developing the interviews, the first step is to have the Ergo-Team Investigators identify exactly what it is they would like to know about how the employees work, the layout of the workstation, and the strategies and activities of the employee.
- The Ergo-Team Investigators must be prepared to ask additional questions to explore the comments given by the employee volunteers. For example, an employee might mention that they injured their shoulder while completing a previous job at the company. In this case, the Ergo-Team Investigators might wish to pose a supplemental question such as, "Does this injury still bother you in your current job, and how does it impact your work? Do you have special techniques or strategies to avoid discomfort?"

Activity 2: Designing a mock interview

√ As a training exercise the following list of topics should be presented to the Ergo-Team Investigators. They should view the ***Pan Wash Sample Video*** ***(Video for Analysis and Development of Questions)*** and think about how each topic impacts the work and employee and then come up with specific questions to ask in an interview:

Workstation and environment topics

- the physical dimensions of the tables, chairs, conveyor belts, and other workstation items
- the dimensions and weights of loads that are manipulated in the work tasks
- the location and dimensions of load origins and destinations and their distance from the employee
- the type of floor surfacing, if the employees complete tasks while standing/walking or pushing/pulling loads
- the amount of space available between employees while completing work
- the amount of space for walking between and through workstations
- the temperature of the area
- whether there is water or dampness in the area

- the amount of lighting in the area
- the types of required personal protective equipment in the area (e.g., boots, gloves, thermal protection, water protection, ear plugs, safety glasses).

Psychosocial topics

- Do employees have the appropriate training to do their work?
- Do employees have any control over their work load?
- How satisfied are employees with the job and difficulty of that job?
- Is communication in the workplace effective (clear, timely, appropriate)?
- Are employees required to make many decisions and are they supported with the resources and information needed to make those decisions?

Organizational topics

- What is the speed of the work and do employees have control over the pace?
- Where does the work fit into the other jobs and departments of the company?
- Employee interaction within the job, department, and the company – does a worker rely on a co-worker to complete a task or job?
- The different tasks the employee completes – do they rotate with other jobs and departments, or complete multiple tasks in one particular job?
- Are employees working night shifts?

√ Next, have the Ergo-Team Investigators come up with a list of questions they could pose to the worker with respect to their physical characteristics and work history. The following topics/ areas might be important for them to consider when developing their questions:

- Does the person's size impact his or her work?
- How long have they worked at this job?
- Have they worked at other jobs at this company?
- How could these previous jobs have impacted his or her health and productivity?
- Was there special training given for their job?

√ After their brainstorming session they will likely have developed a variety of context specific questions. Have the Ergo-Team Investigators review the ***Draft Employee Interview*** provided.

√ They can then adapt the questions in the script to reflect their context specific questions, or perhaps add some of their own additional questions.

Activity 3: A mock interview process

√ After the investigators have developed their interview based on the ***Draft Employee Interview*** and attained mock consent in *Activity 2*, have them do a mock interview. The ergonomist can serve as the employee who was in the ***Pan Wash Sample Video*** ***(Video for Analysis and Development of Questions)*** and the investigators can conduct their interview. One investigator should record the information, and the other should pose the questions.

√ The ergonomist should provide feedback to the investigators during the interview. Ensure that they:

- Pose questions that require more than 'yes' or 'no' answers
- Probe for additional information when applicable

Review all of the recorded information to ensure they are writing down the key topics

MODULE 6:
Video Recording

❖ **Learning objectives:**

1. Understand the need for video recording
2. Understand some simple methods to record digital video
3. Understand 'job cycles' and 'micro-cycles'
4. Understand methods to extract, store , and organize digital video on a computer

❖ **Activities:**

√ Mock video recording session

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.4.3 Training for job analysis using digital video recordings

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Video capturing

Explain to the Ergo-Team members:

- The preliminary interview will identify areas of concern for the employees, while the Ergo-Team members will also have an idea of some of the potential issues.
- Complete analysis is needed to investigate these issues and to determine potential solutions. However, doing a thorough job analysis can be very challenging, particularly for beginners.
- One way to make the task easier is by training the Ergo-Team to digitally record the employee volunteer doing the job and then provide them with the software they need to analyse the video on a computer using slow motion viewing.
- To capture video, use a <u>standard digital camera</u> as:
    - they are relatively cheap and attainable;
    - operating a standard digital camera requires very little technical know-how; and,
    - they are compact and easy to carry throughout a workplace.
- Standard digital cameras can be equipped with extra memory and then used to record 10-20 minutes worth of video. This should be more than sufficient (a few minutes may be all that is needed) for the analysis of the movements involved in most jobs (this is particularly true of assembly line jobs).
- It is recommended to practice video-recording using another member of the Ergo-Team prior to starting the real job analysis. (See "*Activity 1*: Mock Video Recording")

- It is important to extract your digital video to a password protected area on a computer and to organize the videos in a way that helps to organize the ergonomics analysis.
- When making the video, the Ergo-Team members should keep in mind that work is made up of a series of **job cycles**, and each job cycle contains various **micro-cycles**. For example, a job cycle shipping a pallet, with a micro-cycle preparing the pallet with product.
- The micro-cycle is made up of **tasks** and **operation**s. For example, a task could be filling a pallet with boxes, with the packing of each individual box being an operation. Within each operation there are sub-operations that must be preformed. These might include: reaching for a box, lifting the box, carrying the box, and lowering the box. With the operations and sub-operations, the various joints of the body perform **movements** and hold various **postures** to allow the person to work. These concepts are further explained in the next module.
- Another thing to keep in mind when taking the video is to ensure that the video captures the volunteer participant from both the front and the side. This will help to ensure all motions and postures are clearly visible and available for analysis.
- Remember that although the volunteer participants have agreed to be video recorded while they work, co-workers in the work area have not and may not be comfortable with being recorded. It is important therefore to inform everyone in the area of what will be taking place and to get permission from those *around* the volunteer participant to be video recorded. If they are uncomfortable or unwilling, move the workers around so only those in agreement are on the screen.
- The Ergo-Team member taking the video should clearly explain to the volunteer participant that they should work as normally as possible and try not to change their routine in response to the video collection process.
- Patience is also needed – do not prompt workers to complete tasks on demand in order to speed up the recording process. The video should be a real-time representation of the work so that the Ergo-Team can get a clear sense of:
    a) the time it takes to complete tasks
    b) the frequency of such tasks
    c) the average amount of rest time between micro-cycles and cycles.

Activity 1: Mock video recording

√ For the practice video recording, review the ***Video Recording Instructions*** and have one member of the Ergo-Team carry out their normal job, if suitable, otherwise have a volunteer employee complete their work. The Ergo-Team member then practices video-recording while the other employee does their job. Their work tasks should be captured from front, side, and perhaps overhead views for an appropriate amount of time.

MODULE 7:
Basic Ergonomics

❖ **Learning objectives:**

1. Understand the role of posture and movement in ergonomics
2. Understand how to use anatomical terms to describe posture and movement
3. Understand the various risk factors for WMSD

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.2 Training the Ergo-Team in Basic Ergonomics

Before the Ergo-Team investigators can analyze the video they have taken of the volunteer participant, they will need training in ***Basic Ergonomics*** and knowledge of the motions and postures (through the ***Motions and Postures***) that are associated with WMSDs. There are a number of resources that can be used to introduce the Ergo-Team to ergonomics some of which are presented in this package to help in the training process.

Motion descriptions

Explain to the team members:

- In order to assess the risk of injury associated with particular job tasks Ergo-Team members need to develop a shared vocabulary and understanding of the different kinds of movements they should be watching for in their assessment.
- Ergo-Team members need to understand the terms that describe motion and posture of the trunk, neck, shoulder, forearm, wrist, and hand, all common sites for injury in work settings. This is accomplished with ***Motions and Postures***.
- Anatomical terms such as shoulders, arms, trunk, etc. are commonly used in basic ergonomics training. In general, these terms are part of the average person's common understanding of movements so they are a good foundation on which to build a training program in ergonomics.
- Other key movement-related terms that are *not* part of everyday language need to be established. For example, ergonomists distinguish between ***motion*** and ***posture*** when referring to arms, shoulders, etc. Distinguishing between posture and movement is very important in an ergonomic assessment because both require energy and both can interact to influence the risk of strain or injury.
- A ***motion*** involves the *displacement of a body segment(s) attached to the joint in question*. For example, reaching forward (flexion) at the shoulder to grasp a box.

- A ***posture*** occurs when the body attached to the joint is *placed in a particular position and held there to complete an activity*. For example, holding your shoulder forward (flexion) to get your arm in position to use a tool, or hold a load at a certain height.
- Postures and movements occur in different ***planes of motion***. The trunk or a limb can move or be positioned in a ***forward-backward*** plane, a ***side-to-side*** plane, or they can ***rotate*** left or right about a joint. Depending on how the bones and joints are constructed, that segments can move in *more than one* plane of motion at the same time.

Risk factors associated with WMSDs:

Explain to the team members:

- Our bodies are designed to be active. Activity is essential to good health and includes several factors, including: strength, endurance, flexibility, and mobility in our joints.
- Activities become a health hazard when they place too much strain on particular body structures. When this happens, people are at risk of injury to the muscles, tendons, nerves, and joints in our backs, shoulders, elbows, arms, wrists, hands, and fingers.
- The risk of WMSDs is a result of: the *type* or *combination* of movements and postures; the *frequency* of movements; the weight or *load* being lifted or moved in association with these movements or postures; and, of the *number of repetitions* required during a particular period of time.
- The ***Basic Ergonomics*** lecture discusses some of the movements, postures, and movement-posture-lifting combinations commonly found in workplaces that can increase the risk of WMSDs
- Assessing the degree of risk of a WMSD hazard associated with a particular job or movement requires studying the amount of time spent in the non-neutral posture, the number of repetitions involved, and the related effort required. The risk of injury to joints, muscles, and tendons created by the combination of movements required to complete the job is assessed.
- A job task might require spending only a very small amount of time in a ***non-neutral posture*** but the worker may have to complete that task many times in the course of a shift with this repetition potentially adding to the risk associated with the task.
- When doing an ergonomic assessment of a job or work station, there is a tendency to focus attention on the jobs in the workplace that require heavy lifting. But the weight of the objects being moved is only one of the things that need to be taken into account when assessing risk. The weight of the object need not be great in order to pose a risk; *posture, duration, the number of repetitions, and weight must be evaluated along with influences from the surrounding environment and the organization of the work.*

MODULE 8:
Video/Job Analysis

❖ Learning objectives:

1. Recognize how to apply ergonomics knowledge when analyzing video recordings
2. Learn to identify factors that make work activities a problem
3. Understand how to design solutions to address problems

❖ Activities:

√ Analysis of the still pictures

√ Analysis of mock video (captured during Module 6)

❖ Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" User's Guide:

5.4.3 Training for Job Analysis using Digital Video Recordings

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Analysing the video

Explain to the Ergo-Team members:

- Once the video recording is complete and training in basic ergonomics and motion is complete, the Ergo-Team investigators must analyze the video, while filling in the ***Analysis Tables***.
- *Every task in the job does not need to be analyzed*. Using knowledge from the previous interview and knowledge of the work operations, only the portions of the job that are of interest should be analyzed.
- While watching the video, the Ergo-Team investigators should try to get as much information as they can to describe the work, identify possible risk factors or difficulties, and think about alternative methods of work to improve the job (and to control the risk from WMSD hazards).
- It is important to stress to the Ergo-Team investigators to be mindful of the following things in each video:
  1. Who is working and what are the characteristics of this person?
     - age
     - sex
     - height
     - right / left handed
     - experience/seniority
  2. In what conditions is this person working?
     - What sort of environment are they working in?

- Do they wear personal protective equipment (earplugs, hat, apron, safety glasses, footwear etc.)?
- What kind of surface are they standing on?
- What are the psychosocial aspects of their job (Are they under any stress? Do they have to meet a quota? Are they under any mental strain from work)?

3. How does he or she do their job?
   - Physical
     - general posture of the body
     - posture and effort in each operation (see ***Table 1***)
   - Time constraints
     - How long is each work cycle?
     - Do they take breaks?
     - How much time is spent at each work station?
   - Mental and cognitive work factors
     - Does their job require concentration?
     - Do they have to make decisions concerning their work?
     - Does the worker have to evaluate the product for quality or size?
     - Do some products have to have other tasks performed on them?
   - Social dimensions of the activities
     - Do they need to communicate while working (is it a part of their job)?
     - Do the workers help each other?
     - *Can* they communicate while working (socially)?

4. Why do they perform certain tasks that way? What are other ways of performing the same task?

- The Ergo-Team investigators should watch the video in its entirety a few times before they start analyzing it; first at regular speed, and then at a slower rate, in order to fully assess the job task. One way to approach a job analysis is to do it in steps moving from the most general to the most specific.

To help the Ergo-Team member to understand the process of analyzing the work using activity centred analysis, review ***Explaining Activity Centred Analysis***.

Activity 1: Becoming familiar with analyzing work operations

√ Have the Ergo-Team members complete the ***Picture Analysis Exercise for Motion and Posture*** along with Table 1 in the ***Analysis Tables***. Describe the posture and movements for each of the listed operations.

√ The ergonomist should review the analysis and point out corrections or changes that should be made (***Picture Analysis: Answer***). This can help the investigators to improve their skills.

Identifying critical situations and designing potential solutions

Explain to the Ergo-Team members:

- After completing the analysis of all operations in Table 1, you will have noticed certain activities require more effort than others, or that repeated movements or postures are common in all operations. These exposures may create injury risk.
- You can now use your analysis in Table 1 and compare the findings to key issues identified during interviews, in the body map survey, and/or your observations. You can begin to link reported issues with activities, and to record why you think that activity could contribute to the risk of a WMSD.
- Later, these findings can be discussed with the volunteer participant and others in the work area (workers and supervisors) to get their input on the analysis and your findings.
- Use *Table 2* of the ***Analysis and Information Tables for Ergo-Team Interventions*** to enter this information. The ***Analysis Tables Example*** can be used to help. This example is referenced in the items below.
    - In column 1, state the issue, (for example: discomfort in the back).
    - In column2, state some possible activities that you think are related to this issue. For example, you might state, "reaching for materials on a conveyer belt" is an activity that is related to discomfort in the back.
    - In column 3, list the reasons that could explain why that particular activity might cause the stated problem. Again, rely on the information gathered in Table 1. For example, you could list "the belt height is too low – forcing constant need for trunk flexion to attain material."
    - In column 4, list potential solutions to overcome the problems with that operation. For example: "raise the height of the conveyer belt, so that the employees can take the material without flexing the trunk." This is only a simple example and other problems will present greater difficulty.
- This Table should allow you to take all the information you have gathered into consideration; make sure you do not focus just on posture and movement and *physical issues*. Consider what you know about production processes, training, organization of the work, and what employees told you during informal conversations and during interviews with the volunteers.
- For each issue that exists, there could be several activities/tasks, operations, and sub-operations that contribute to it. Additionally, for each operation or sub-operation, there may be several determinants that contribute to the problem. Some of the determinants may relate to the movement and posture analysis completed in Table 1, but other determinants may relate to organizational and production knowledge gained during the interview with employees or your knowledge of the work. For example, for "reaching for materials on a conveyer belt" you might note, "fewer" employees available during evening shift – forces remaining employees to reach more often and faster" as a work organization determinant that has an impact on this activity and therefore on the risk for back discomfort.

- Also consider some employee-related determinants. For example, taller employees will have to bend further forward when taking material from the conveyer.
- Consider if there are certain strategies utilized by employees to make the work more efficient and easier; is this something novice employees know about and are they trained appropriately?
- As many solutions as possible should be discussed and reviewed with worker participants for their input. After gathering the data from the participants the results should be discussed with members of the Ergo-Team to determine the practicality of each approach and its potential benefit for the employees.

Activity 2: Mock job analysis

√ Have the Ergo-Team members complete a full job analysis of the mock video that the investigators captured during module 6. Have them use ***Analysis Tables*** **1 and 2.**

√ The job analysis should be completed with some guidance from the ergonomist, but the Ergo-Team members should try to use their own ideas and analysis as much as possible. Once complete, the ergonomist can review the analysis and provide feedback on errors or adjustments that should be made.

MODULE 9:
Post-Job Analysis Interview

❖ Learning objectives:

1. Understand the steps required to review your work analysis with the employee participants
2. Identify additional questions to pose during the review with participants

❖ Activities:

√ Mock post-job analysis interview with the ergonomist

❖ Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" User's Guide:

5.4.4 Post-job Analysis Worker Consultation

Explain to the Ergo-Team members:

- The purpose of the post-job analysis interview is to review the job analysis results (***Tables 1 and 2***) with the worker(s) involved and to seek their comments and input. It can also be used to allow the Ergo-Team investigators to improve their understanding of the job.
- After the video analysis, you will create your *Post-Job Analysis Interview Script*. There is no template for this interview. It will change with each intervention/ worker/work area.
- Any questions that arise during the activity-centred analysis are posed to the volunteer participant at this time.
- Examples of the kinds of additional information you will try to collect include:
    - reasons for the location of tools/objects
    - employees' perceptions of work pace by employees
    - observations on why activities, postures, and movements are performed in a certain manner or sequence
    - reasons for differences in technique among workers when completing a task
    - the effect of employees' stature on the tasks
    - information on cooperation and interaction among employees when completing job tasks
    - variability of working tasks and conditions.
- During this interview with the volunteer participant, review some of the solutions/recommendations for changes posed by the investigators and ask for suggestions to improve them, and/or add their own ideas for changes.

Activity 1: Mock Post-job analysis interview with the ergonomist

√ Have the Ergo-Team investigators interview the ergonomist, who will be playing the role of employee. Have the investigators present their findings from their mock analysis (*Activity 2*, Module 8).

√ Along with reviewing their analysis, have them ask questions about:

- reasons for the location of tools/objects
- perceptions of work pace by employees
- observations on why movements are performed in a certain manner or sequence
- reasons for differences in technique among workers when completing a task
- the effect of employees' personal characteristics (age, sex, experience, etc) on the tasks
- information on cooperation and interaction among employees when completing job tasks.
- variability of working tasks and conditions

√ Have the investigators review their solutions (***Table 2***) and ask for input on adaptations to the solutions and enter the data from the employee volunteers (***Table 3***).

√ The ergonomist can provide feedback and suggestions to improve their interview skills following the interview.

MODULE 10:
Developing the Ergo-Team Report and Recommendations for Submission

❖ Learning objectives:

1. Understand steps to review information as a team
2. Understand how to share ideas and discussion among the team
3. Understand the steps required to prepare a report for submission to the JHSC/Management

❖ Activities:

√ Mock brain storming session

❖ Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:

5.4.5 Developing the Ergo-Team Report and Recommendations for Submission to the JHSC

Brainstorming and reporting

Explain to the Ergo-Team members:

- The next step in the Ergo-Team intervention process is for the investigators to review the digital video and results of their analysis with the other members of the Ergo-Team and explain to them the critical situations.
- The investigator will also present relevant information from the pre- and post-job analysis interviews with volunteer participants and workers in the area.
- The investigator will ask for input from the Ergo-Team members on the solutions they have developed in order to ensure managerial, supervisor, and maintenance concerns are included in the design of a solution.
- The discussion can begin with a *brainstorming* session involving *all* the Ergo- Team members.
- The goal of your brainstorming is to review the developed solutions, propose required adaptations, and potentially create new solutions
- Input should come from *all* members of the Ergo-Team, and not be dominated by one group or representative.

- Comments from the team members can be recorded in ***Table 3***. All potential solutions should be recorded and discussed by the Ergo-Team to determine the feasibility of the solution from production, management, maintenance, and employee perspectives.
- Once all the solutions have been discussed and the preferred solutions and adaptations are selected, they should be recorded in ***Table 4***. This table can be used to plan the steps required to implement the changes, including: information on what exactly must be done, who needs to be involved in the changes, and a timeline for the changes.
- Using the information in ***Table 4*** as a template, a report can be developed on the proposed changes and the plan for implementation. This report will then be reviewed by JHSC and/or Management, depending on the decision-making process at each workplace.

Activity 1: Mock brainstorming session

√ Have the Ergo-Team investigators present the information they gathered during the mock video analysis (Module 8, *Activity 2*) and the mock post-video interview (Module 9, *Activity 1*) to the rest of the Ergo-Team members.

√ Have the team discuss the potential solutions that the employees identified in the mock analysis, as well as develop new solutions. The ergonomist should facilitate the discussion to ensure it remains focussed, and that no group is dominating the discussion over another.

√ Have the team fill out ***Table 3*** and record the adaptations to existing solutions as well as the creation of other solutions.

Implementation of the changes

Explain to the members of the Ergo-Team that:

- If the report recommendations are accepted by JHSC/management, the plans for changes should be communicated to the Ergo-Team as well as workers and supervisors in the work area and to the larger plant labour force. Refer to your reports and Table 4 to outline the plan for implementation, who will be responsible, and the timeline for the changes.
- If the recommendations are rejected, the team should consider revising the recommendations to address the concerns of JHSC/management.
- Once a recommendation is approved, a prototype of the changes can be developed and trialed using employee volunteers. A review of the changes with the employees can help to refine the changes to ensure they will be appropriate for the work.

- Once the changes have been finalized, a general poster, pamphlet, or other such document could be developed and distributed throughout the company explaining the implemented changes and plans for future work by the Ergo-Team. The pamphlet could also serve as a way to recruit future job assessment volunteers.

MODULE 11:
Evaluation of Implementation

❖ **Learning objectives:**

1. Understand the need to review the changes that are made
2. Understand the steps required for review of the changes
3. Understand what must be done if adaptations are required

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

5.11 Evaluation and Follow-up

Evaluation

Explain to the Ergo-Team members:

- You should have the investigators return to the intervention site to review the employee and supervisor opinions of the changes. This will take place after a grace period in which the workers and supervisors have had some time to work with the new changes.
- The employees and supervisors may identify potential employee, production, and organizational issues that may have affected the outcomes of the intervention.
- It is critical to get feedback from areas upstream and downstream of the area. The implemented changes may have alleviated problems in the immediate work area but created problems elsewhere.
- Any concerns can be taken back to the Ergo-Team for consideration and plans can be altered accordingly and resubmitted to the JHSC.
- Although conversations are a great way to gather information from your peers, particularly in the area where the intervention occurred, it may not be possible to talk to everyone who is impacted by the changes upstream and downstream.
    - You can administer an '***Intervention Evaluation Survey***' to gather information from the general employee population.
- If new or ongoing problems/hazards are identified at the workstation, or upstream/downstream, you should use information from the evaluation survey and conversations with employees to guide a re-analysis with ***Analysis Tables 1 and 2*****.**
    - With a return to the *Investigate* phase of the ***Ergo-Team Framework***, you can use the tables to record these issues and find proper adaptations to the problem.

    - Adaptations would then be reviewed by the team in a brainstorming session and a new set of implementation plans can be developed to fix the problem.
- **The process of developing recommendations, implementing them, and following up with an evaluation should continue until the design matches the needs of the employees without negative consequences for their work and/or comfort.**

MODULE 12:
Moving Forward and Maintaining the Ergo-Team

❖ **Learning objectives:**

1. Identify strategies to ensure ongoing team activities
2. Understand the role of the ergonomist in future investigations and interventions

❖ **Related sections of the "*How to Implement an Ergo-Team Approach to Participatory Ergonomics*" *User's Guide*:**

6.0 Maintaining the Momentum

Moving forward

Explain to the team members that:

- Now that you have completed your training, the first intervention project can be started. Return to the ***Ergo-Team Framework*** and begin the intervention process, starting with the **Investigation** phase.
- The process of identifying areas, investigating the issues, proposing solutions, and implementing and evaluating changes does not need to be as time consuming as the initial training projects. Your skills will improve over time, and you will be able to identify problems, diagnose the issues, and develop solutions much quicker.
- For this first intervention, the ergonomist will continue to guide you through each phase of the intervention, providing some help and feedback along the way. The idea is that after this first intervention, you will be better prepared to continue on with ergonomics projects in the future with less involvement from the ergonomist.
- Now that you have done some work with a preliminary project, you can tackle any issues you identify as problems and you should avoid only working with 'quick-fix' or easier issues. In addition, depending on resources, you may be able to tackle multiple projects at the same time.
- It is important to note that the Ergo-Team is not a replacement for an ergonomist. You will need to maintain contact with an ergonomist to ensure you have help with:
    - Training of new ergonomics team members - Be aware that some members of the Ergo-Team may leave the company for another job, retire, or choose not to continue their involvement. In these cases, new members need to be recruited

and trained. Training of new members should be completed by Ergonomists who are trained to do so.

- Review of your projects, analysis and solution - Although you are able to function independently to identify problems and propose solutions, you should periodically ask the company to bring in an Ergonomist to review your solutions and help with more difficult problems that extend beyond your training as they arise.

- Promoting the work of the Ergo-Team and maintaining the team's momentum is important. Some ways to do this are to:
    - hold regular meetings to present your work to the JHSC committee, union representatives, management, and the workforce. This will ensure that Ergonomics remains an ongoing initiative across the company.
    - remember to keep in contact with the management personnel who have supported your work from the beginning. They will help to provide resources and remove barriers.
    - find ways to celebrate your victories when they have them. For example, write about successful projects in news articles in the company newsletter, or find ergonomics conferences to present your successful projects at. Also, it might be possible to write a short article for external newsletters, journals, websites, or other media. Check with the Ergonomist and company stakeholders to review these opportunities.

Conclude the training with the Ergo-Team

We have now completed the Ergo-Team training process. The strength of this approach revolves around the participation from all levels of your organization, and the work you do to share knowledge. We invite you to keep the tools and training resources we provided you during the training process to act as a reference during your upcoming projects. For your first intervention, the ergonomist will continue to help you through the process and provide feedback to further develop your skills. Through the work of the Ergo-Team and continued interaction with a professional ergonomist, both in your first intervention project and in future projects, you can continue to develop ergonomics capacity in your company. If you have any questions, comments or feedback on your training or the direction of your Ergo-Team program, please feel free to contact the ergonomist.