



# ERGONOMICS FOR ARBORISTS AND LANDSCAPERS - PART 1

By: Camille Di Monte Peterson, P.T.

When the term “ergonomics” comes up, many people tend to think of it as a product. And why not? There are so many companies out there boasting of their ergonomic products, encouraging you to buy, buy, buy, with the unstated understanding that once you buy the product, your troubles are over. Unfortunately, many have been deceived in this way, and any thoughts on the term ergonomics turn quite sour. Please understand that this is not a slam on all of the tools and technology available out there, as there are many very useful and well-designed tools of good quality on the market to assist a person to perform work activities in a safe and efficient manner. The point is that the term ergonomic, while used in marketing, is frankly over-used and can be misleading. Tools and technology that take into account human needs and capabilities provide valuable assistance in fitting the job to the person. As a result, their health and physical abilities or limitations are not compromised, thus preventing work-related injuries. However, tools and technology are a part, albeit an important one, of a greater whole.

For continuity’s sake, I’d like to first get the definition of ergonomics clear. For our purposes, we will use this definition: *Ergonomics means fitting jobs (activities/machinery/tools) to people, so that people can derive the greatest benefit from a safe, positive, and healthy environment; it means well-being at work and at home.*<sup>1</sup>

There is such a huge range of variation in body size, limb and proportion size throughout the population that it is difficult to make one tool or one rule for performing the same job task in exactly the same way, for all people to prevent injury, minimize stress, and improve efficiency. Therefore, we need to take into account the individuality of each person, and observe the activity it takes for that person to complete a job task. For example, a 6’3” arborist or landscaper will most certainly perform job activities differently than a 5’7” person. They may each require different tools of varying lengths and hand-grip circumference, as well as differ from the way in which they approach different work tasks. Arborist/landscaping jobs have a wide range of essential job functions (those physical/mental activities that are essential to successful completion of their work) compared to a job like assembly-line factory work. As a result, it is necessary to break down the job functions and analyze the movements of the human body required to complete

each of these functions.

Ergonomics is also an ongoing process rather than a product. A good program should focus on maintaining the health and well-being of the worker, including prevention of work related injuries. The program should be a team effort, include a variety of people, and be in a continual process of evaluation of the situation/job, modification, implementation, and finally, evaluation of the changes to make sure it is effective. It should be a continuous circle of process, with evaluation to make sure the changes are effective, leading back into evaluation of the situation/job if the changes weren’t effective, or if a new employee is added to the mix.

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*skeletal disorders (MSDs).* MSDs, or musculoskeletal disorders, are injuries and disorders of the soft tissues (muscles, tendons, ligaments, joints, and cartilage) and nervous system. They can affect nearly all tissues, including the nerves and tendon sheaths, and most frequently involve the arms and back. Risk factors for MSDs include: Force, Repetition, Awkward postures, Static postures, Quick motions, Compression or contact stress, Vibration, and Cold temperatures.

MSDs which we find common in the arborist and landscaping injuries include: working in cold temperatures which can affect a worker’s coordination and manual dexterity; excessive repetition of movements such as is the case with hand pruning tools; heavy lifting of limbs and branches, rolls of sod, etc; vibration from tools such as chainsaws; and working in awkward positions such as those experienced by climbers. These types of activities, either alone or combined, and occurring for extended durations or magnitude, contribute to MSDs.

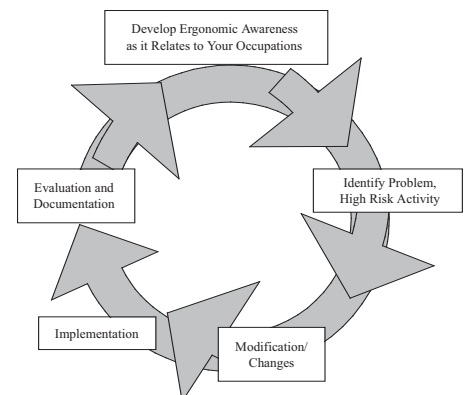
There are also non-work-related factors that can cause or contribute to MSDs and include the employee’s physical conditioning, certain medical conditions, certain hobbies, pregnancy, psychological conditions, and home or workplace stress. All of these factors can add to the risk of devel-

oping MSDs.

Why and how do we begin this journey of the ergonomic process? Why and how do you, as an employer or employee, apply this knowledge to your specific profession? Answering why is quite easy: as an employer, it comes down to a healthy, productive and efficient employee, with good employer-employee relationships, and prevention of work related injuries which hold high the morale of your employees. A good program will also prevent the high expenses incurred through medical/legal costs, lost work time, decreased productivity, as well as higher insurance premiums five or more years later. As an employee, by avoiding work-related injuries, you may save yourself years of stress and aggravation, not to mention the pain, loss of finances, and lowered self esteem which may invade your home and personal life.

The ergonomics process takes a team effort, and can only be accomplished in a positive way if the management is involved, and does not carry with it old prejudices, and poor attitudes concerning the worker. The first step to take is to develop an awareness of ergonomics and to understand what that means for your line of work. For instance, we said earlier that a 6’3” person will do a task differently than a 5’7” person. To reduce the chances of MSDs, a company might need to purchase different sized hand tools for these two workers to compensate for their different hand sizes. Or two people working together can swap tasks to reduce the repetitive nature of their work, i.e., one worker could use the shovel for an hour while one plants the shrubs and then switch tasks.

As we focus on the various jobs an arborist or landscape worker might do, it will be necessary to conduct a thorough job hazard analysis. This analysis might include a risk factor checklist, a survey, or a questionnaire. Once we have observed



the activity we can determine the risks involved. Once we know the risks we can modify the tasks (provide different tools, swap tasks, etc.). Then we can evaluate the changes to determine if it solves the problem. This is where both the employer and employee must maintain open com-

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munication. The employer must encourage his employees to feel comfortable about discussing the problem and the employee must be willing to speak up and offer alternate suggestions.

There is much value to the old way of working your way up by starting in the trenches. Supervisors, managers, and owners who have gone this route have obtained incredible knowledge, skill, and have experienced the work firsthand. But this is where we must take a serious look at the training of new employees. It is important that we do not pass on bad work habits. Rather, we must look at where and how the injuries have occurred in those workers and initiate new work methods using tools and equipment which eliminate or substantially reduce the hazards of the work, better maintenance, (engineering and

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administrative controls rather than work practice controls as the first choice) that reduce those injuries. These experienced workers can be a valuable asset to the new workers, but only if they are willing to learn from their injuries and develop new work methods. It is important to take what we have learned from these experienced employees and to identify what types of education, training, or equipment

modification we need in order to prevent the MSDs.

The price of prevention is well worth it, considering that the cost of a work related injury (in terms of financial cost as well as the effects on employer–employee relationships and morale) can devastate a small- or medium-sized company. When developing an ergonomics program for your workers, do not be afraid to call upon resources such as OSHA consultation or compliance assistance specialists who are available at no cost to the company as well as therapists specializing in work injury prevention and management, ergonomics engineers, and knowledgeable safety consultants. You can start developing your ergonomics program by knowing the seven essential elements of a program.

### **The Seven Elements of an Ergonomic Program:**

**One:** Look for signs of a potential MSD problem. This could include identifying job tasks that require repetition or force, or workers that complain of aches and pains.

**Two:** Show that management is committed to addressing the problems and encourage workers to participate in problem-solving activities.

**Three:** Offer training to expand management and worker ability to evaluate potential MSD problems.

**Four:** Gather data such as medical records, injury reports, and job analysis to identify job tasks or conditions that may be the most troublesome.

**Five:** Identify effective controls for tasks that pose a risk of MSD and evaluate these controls once they have been instituted to see if the problem has been alleviated.

**Six:** Establish health-care management to emphasize the importance of early detection and treatment of MSDs.

**Seven:** Minimize the risk factors for MSDs when planning new work processes and operations.

By implementing these seven elements, you are well on your way to preventing MSDs.

An ergonomics program is only going to be as good as the employer and the employee make it. Each has a responsibility to the other. It is the responsibility of the employer to provide a safe working environment for the employee, and to provide training to the employee to equip the person in completing the job safely. It is also the responsibility of the employer to make sure that problems identified are solved, as well as to have a role in identifying potential safety problems. Under the OSHA guidelines, it is the employee’s responsibility to perform job tasks required in a safe, efficient manner, and to perform them the way he/she is trained. But to take this a step further, an employee should also be willing to assist with identifying possible problems with job design. It is also the employees’ responsibility to take care of themselves off the job—eating a reasonable diet, drinking plenty of water, getting enough sleep at night, and avoiding behaviors that may risk their health. I will suggest here that instead of common sense, it is about “learned sense.” Once you take the first step to know what the risk factors are in developing MSDs, become aware and understand some of the fundamental principles of ergonomics, and have some examples in how they can be addressed, you will begin to develop the skills to improve the safety of your work. In this way, it is about “learned sense.”

In the next two articles in this series, we will discuss proper body mechanics, physical conditioning, and tools and equipment as they relate to the arborist and landscape worker.

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Resources:

<sup>1</sup>An Ergonomics Process, Copyright © 1988, 1991 The Regents of The University of Michigan, Jeffery K. Liker, PhD, Associate Professor of Industrial & Operations Engineering, and Don B. Chaffin, PhD., P.E., Professor of Industrial & Operations Engineering, both of The University of Michigan.

*This article was produced by the Forest Industry Safety & Training Alliance, Inc. and funded by a Susan B. Harwood Training Grant from OSHA.*