

Managing Ergonomics in a Lean Environment

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Introduction

Lean manufacturing has replaced mass production for almost half of all U.S. manufacturers. Lean has helped employers improve operating efficiencies and retain manufacturing jobs in the States.

Unfortunately, many of these employers have seen their workers' compensation costs skyrocket after implementing lean concepts. For example, an automobile manufacturer experienced a 100 percent increase in cumulative trauma disorder (CTD) cases and received a Cal/OSHA citation for "insufficient attention to ergonomics" after implementing lean during a changeover of one assembly line in 1993.

That same automobile manufacturer implemented lean on a second assembly line model changeover and integrated ergonomics into the process in 1995. The result? The changeover was completed in 38 percent less time, achieved similar productivity gains and quality improvements, and reduced the number of injuries by 30 percent on this line.

Risk control processes must evolve to anticipate and effectively manage cumulative trauma disorder (CTD) risks that arise in the lean environment. Since lean and ergonomics share the goals of eliminating waste and adding value, there are natural ergonomic integration points in most lean processes. Ergonomics is simply another tool that can be used to make your lean processes more successful. Let's look at how ergonomics can help you achieve your lean objectives.

Applying Lean Processes

Lean manufacturing processes seek to create value and minimize waste to achieve a higher return on your capital investment. Using multi-disciplinary Kaizen teams, lean companies evaluate workstations, production cells, and entire assembly lines to streamline operations and eliminate waste. The seven key wastes that lean processes seek to eliminate are:

- Correction - repair and rework
- Motion - any wasted motion to pick up or stack parts, long reaching distances, unnecessary long walking distances, etc.

- Overproduction - producing more than is needed right now
- Conveyance - unnecessary movement of materials or finished goods into/out of storage or between processes
- Inventory - maintaining excess inventories of raw materials, parts in process, or finished goods
- Processing - doing more work than necessary – redundant material handling, unnecessary grinding or finishing, etc.
- Waiting - any non-work time, such as waiting for parts, looking for tools, reaching for materials, etc.

By reducing waste in these key areas, significant cost savings can be achieved. This cost savings enables U.S. employers to compete in the global marketplace despite our higher labor costs.

Unfortunately, lean processes can make jobs highly repetitive while eliminating critical rest time for employees. When ergonomics is not integrated into the process, the repetitive jobs take their tolls on employees as stressful postures and high forces are repeated over and over throughout the day. In the long run, the financial savings from the productivity gains and quality improvements are used to fund the higher cost of CTD claims. But, as we noted with our auto manufacturer example, higher rates of CTDs are not inevitable.

Integrating Ergonomics into Your Lean Processes

Integrating ergonomics into your lean process begins in the planning stages. To ensure ergonomics is a key component of the lean process, ergonomics and safety must be core values of the lean process in addition to waste reduction and value creation. All lean leaders and lean team members should understand the mission of the lean process and the role ergonomics plays in the successful implementation of the process. Ergonomics metrics must be included in the lean process to evaluate the impact of lean “improvements” on the CTD risk factors associated with the job(s).

Factors that should be considered to effectively integrate ergonomics into your lean process include:

Lean Prioritization: To select work areas or production processes for lean analyses, many companies use value stream mapping to visualize their operations. Marsh recommends incorporating ergonomics risk assessments and quality metrics into the value stream mapping process to provide a structured method for prioritizing lean opportunities.

Ergonomics Training: Training of the lean team leaders and Kaizen team members is a critical component of any lean process. Basic ergonomic concepts and ergonomic design factors should be included in this training to enable team members to apply these factors as they develop conceptual designs.

Ergonomic Design: Focusing the lean teams on ergonomic design concepts will help them accomplish their lean goals, while considering how the employees interface with the workstation, tooling, parts, and environmental factors. Applying ergonomic design concepts will reduce costly

errors, improve productivity, and reduce CTD risk factors that lead to higher workers' compensation costs.

CTD Risk Assessment: Quantifying the CTD risk factors present before and after new lean work flow and workstation designs are implemented enables lean teams to confirm the positive impact on the level of risk or identify unintended consequences of the new design that may lead to increased CTD risks.

Stakeholder Involvement: Involvement of the users of the process to be redesigned (hourly employees, supervisors, maintenance, etc.) is critical to the success of any lean intervention. These stakeholders understand problems with the workflow, issues with incoming parts and equipment, and variances in production scheduling that may not be apparent to an external lean team. Some of the best design ideas will be generated by the hourly employees who work in the areas. Stakeholder involvement is also crucial to the acceptance and effective implementation of the lean design modification.

Quantify Your Impact: Measuring the financial impact of the lean ergonomics solutions is essential to attain continued support and involvement of senior management. Frequently updating management on the significant cost savings in productivity, quality, and workers' compensation claims will ensure that the process will continue to be a management priority.

Create A Culture For Success: Creating a culture of employee involvement and empowerment in the lean ergonomics process establishes a positive working environment in which workplace changes are expected and accepted. Sharing the mission and goals of the lean process and recognizing employees who make meaningful contributions to achieving cost savings will make the process successful and effective.

Ergonomics simply provides additional tools for lean teams to reduce waste and create value within your organization. Ergonomics is not another step; it is just part of the process. Without ergonomics, lean processes can lead to costly workers' compensation claims in the months and years after implementation. With ergonomics, lean processes can achieve cost savings goals and reduce workers' compensation costs going forward. Can your company afford to ignore ergonomics as you create a lean organization?

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