



Need Results With Your Ergonomics Program? Use A Board Certified Professional Ergonomist

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Brief Description: Many ergonomic programs do not reach their full potential because they fail to seek and incorporate the expertise of a board certified professional ergonomist.

This paper explores the value proposition associated with leveraging the knowledge of board certified professional ergonomist, as well as the need to apply both a macro and micro ergonomic approach for greater return on investment on a company's ergonomic spend.

Authors: Vicki Missar, Associate Director, Aon Global Risk Consulting, Gail Gilmore, Senior Consultant, Aon Global Risk Consulting



INTRODUCTION

The science of ergonomics has been watered down significantly by quasi-practitioners who have not received a formal education in ergonomics nor any continued training specific to the field. Many firms use employee's training in a one-time course to consultants with no ergonomic credentials to steer their ergonomics program. It's not surprising then that the deliverables exhibit mixed results and often leaves a program unable to reach its full potential for risk mitigation. In addition the techniques integrated in the plan often lead to poor practices that can actually increase ergonomic risk factors for the employee and flat overall results for loss reduction strategies. In some cases, clients have achieved only minor benefits and minimal returns on their ergonomic program investment with non-certified ergonomic consultants at the helm. This is due, in part, to the micro level of the interventions used by non-Board Certified Professional Ergonomist (BCPE) ergonomists, which typically yield lower leverage solutions and a fragmented strategy. This paper will explore the importance of using a BCPE professional to yield a greater return on your ergonomic investment and more strategic initiatives for long-term sustainability and continued results.

MICRO VS MACRO ERGONOMICS

There are two approaches to ergonomics: microergonomics and macroergonomics. Both approaches aim to improve efficiency in the workplace, however they do so by very different means. Microergonomics focus on distinct components in the workplace. It attempts to optimize the interfaces between individual operators and their immediate work environment. In contrast, macroergonomics, as coined by the late Dr. Hendrick ¹ focuses on the system as a whole in an effort to drive productivity and results across and breadth of the organization. Macroergonomics combines social and technical systems approaches to the design of work systems, applying an overall work system design of the human job, human-machine, and human-software interfaces. ² Aspects of the micro and macroergonomic deployment strategies are shown in Figure 1.

Although microergonomics were applicable and evident during the first 30 years of this field, we now know that it is not enough to provide lasting solutions in the workplace. By only focusing on problems between individual operators and their immediate environments, microergonomists fail to recognize how these distinct problems are interconnected. For example, a company may train safety coordinators to perform ergonomic evaluations of individual workstations. Microergonomists will focus on those workstations in isolation, and may miss the links to equipment standards, design criteria, production demands, work-rest cycles, budget capabilities/constraints, and industrial design (e.g., how did the poor design get there in the first place?).

A wider, more holistic scope of considerations is addressed by macroergonomics strategies. The macroergonomic approach addresses all factors in the workplace and how individual components work (or *don't* work) with one another. It is critical to address the macro elements that may



impact total cost of risk (TCOR), program gaps, pre- and post- claim initiatives, and continuously improve the effectiveness of ergonomic programs. A Board of Certification in Professional Ergonomics (BCPE) accreditation recognizes and addresses the relationship between organizational, technological, environmental, and other subsystems which impact the system. Central to this model, according to Robertson (2001), is integrating the internal work sub-systems of the organization – that is, the social, technical and work environment and aligning these aspects to achieve the desired objectives and the mission of the business.² Without macroergonomic strategies and the integrated model that it follows, programs will flounder and make few sustainable gains year to year.

Microergonomics reveals the symptoms of larger problems, and a BCPE identifies these signs and works to bridge the micro and macro issues for higher level solutions. Programs that remain in the microergonomic level continue to struggle because they never bring together all of the elements affecting the success of the program.

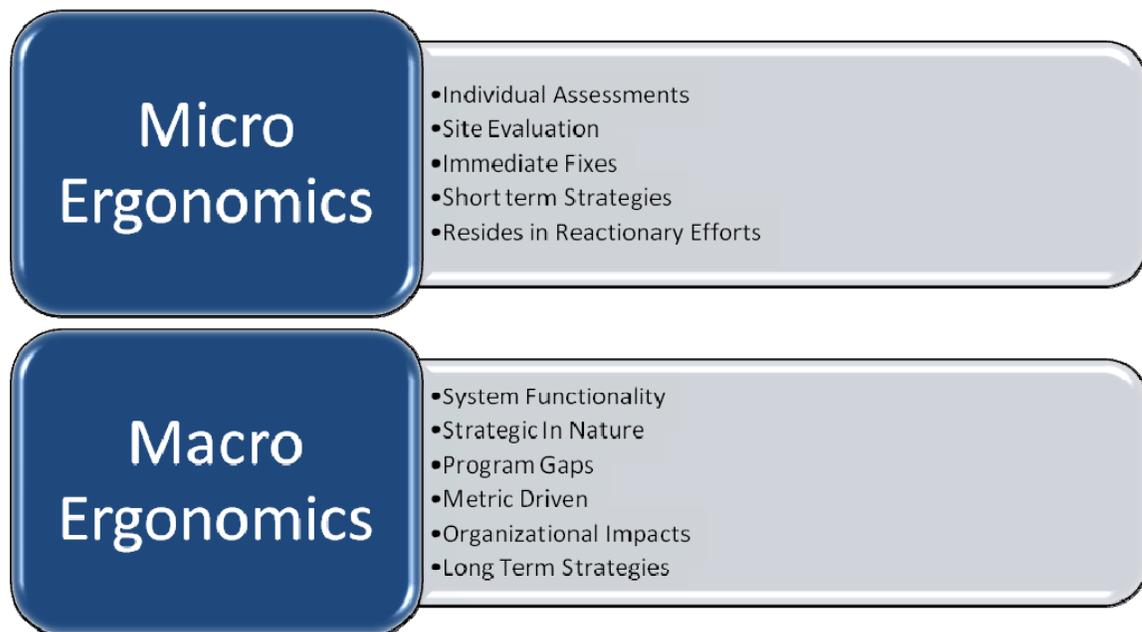


Figure 1: Aspects of Micro and Macro Ergonomics

WHAT A BCPE BRINGS TO THE TABLE

A Board Certified Professional Ergonomist is governed by a certifying body. The CPE program is accredited by the National Commission for Certifying Agencies and requirements include a masters degree or higher in ergonomics or related fields of study and passing a rigorous four hour exam covering human factors, biomechanics, psychophysical elements, etc. Thus, a BCPE



has the credentials and knowledge to practice in the field of ergonomics. Re-certification is required every five years to ensure professionals are remaining current with new industry practices and aligned with any associated regulations.

BCPE's and other IEA (International Ergonomics Association) recognized certified ergonomists around the world are setting public ergonomic policies in places like Switzerland, European Union, the United Kingdom and Brazil to name a few. We are analyzing the macroergonomic breakdowns associated with major disasters like oil spills, and nuclear disasters to resolving human error in hospitals, writing ISO standards and setting course curriculum for the next generation of ergonomists.

When an individual obtains the BCPE, the scope of their practice capabilities are defined by the board. The BCPE has defined the scope of practice for a certified ergonomist and some of the key attributes are shown in Figure 2.



Figure 2: Key capabilities of the Board Certified Professional Ergonomist (Source: BCPE ⁴)



LEAN INITIATIVES IMPACTED

The lack of BCPE utilization has also negatively impacted the lean initiatives, the pursuit of waste elimination, within organizations. In the United States, many lean programs, lacking BCPE influence, implemented changes that improved the system over time, but increased musculoskeletal injury risk factors to the worker. For example, one manufacturing plant's lean team shaved 13 seconds off the per unit assembly time but required the employee to lift the 48 pound product to another conveyor. Score: Lean improvement 1. Employee 0.

Since the lean team focused on a single subsystem – technical assembly unit speed – without considering the impact it would have on other components within the subsystem (workers), the lean team unknowingly increased risk of physical injury and discontent within the workplace. Its focus on microergonomic concerns to the exclusion of macroergonomic considerations created a serious hazard to the welfare of its employees.

Lean can be an effective strategy provided human factors remain at the core and BCPE professionals are utilized to create the best approach, strategy, prototype, testing, standards and solutions. Six sigma projects, for example, can also benefit from the expertise of a BCPE to ensure that aspects of the man-machine-organizational systems are incorporated into the tactics. We have seen many companies create six sigma improvements but fail to realize the risk factors created on the worker. As a result, losses continue and worker satisfaction plummets, leaving a negative stigma for six sigma and future projects.

IMPLEMENTATION OF ORGANIZATIONAL CHANGE

By not having a BCPE–accredited ergonomist at the helm, who deal with organizational change and evaluating opportunities for improved culture, the approach becomes at risk because not all core elements are effectively evaluated. Designing the workplace to fit the worker is a subset of organizational culture. As a BCPE, we evaluate the engineering design, administrative controls, and work practices in addition to the current organization state, leveraging both the macroergonomics and microergonomic approach. This helps to ensure an understanding of the work culture that is contributing to the current ergonomic program climate.

A BCPE is able to use numerous change management techniques, including process audits, planning, and design which, through systematic discovery, can help with opportunity identification and proper implementation to improve an organization culture. A BCPE understands the essential elements that can influence human behavior as well as human performance at work. A BCPE can quantitatively evaluate the physical climate, employees' work practices and work/rest cycles, as well as anthropometrics of the workforce. Incorporating all of these components help to facilitate and manage cultural development and change in a positive way that will have long-lasting impacts that lay the foundation for an amazing, highly impactful future state.



AON ERGONOMICS PRACTICE

Aon has assembled a world-class ergonomics team, and our leaders all carry the BCPE designation and have a wealth of experience (See Table 1). We are proficient in microergonomics (training, workstation assessments) and excel in providing macroergonomic strategies that save clients millions in workers compensation costs. Without the expertise of a BCPE ergonomist, standards, guidelines, epidemiology, solution creation and subsequent implementation may be inaccurate, out-dated, and lacking technical soundness not to mention the potential professional liability exposures for non-BCPE consultants should solutions fail. Also, testimony of a non-BCPE ergonomist may not hold up in court due to a lack of ergonomic credentials.

Table 1: Summary of Aon Board Certified Professional Ergonomists

Consultant	Advanced Degrees	Area of Study	University	BCPE #	Years in Practice
Richard Wyatt	Ph. D.	Industrial Engineering	University of Alabama	151	31
Gail Gilmore	Masters' Degree	Consulting Psychology	Harvard University	196	26
Vicki Missar	Masters' Degree	Biomechanics and Ergonomics	University of Miami	761	23
Murray Gibson	Masters' Degree	Industrial Engineering, Ergonomics and Safety	Auburn University	976	21
Jodi Glunz	Masters' Degree	Industrial and Manufacturing Engineering, Ergonomics	University of Wisconsin	1005	16
Ted DesMarais	Masters' Degree	Biomechanics and Ergonomics	University of Massachusetts	1090	15
Jeremy Wilzbacher	Masters' Degree	Ergonomics and Quality Systems	Marquette University	1387	6
Kyle Saginus	Masters' Degree	Mechanical Engineering and Ergonomics	Marquette University	1804* *AEP	1



CONCLUSIONS

When you need your taxes done, would you go to someone with who has dabbled in accounting or would you instead trust your tax return to C.P.A.? So why hire a non-BCPE to provide ergonomic services? BCPE's have made a career studying ergonomics and are best able to drive macroergonomic strategies to reduce the need for microergonomic interventions. The ergonomics team assembled at Aon is experienced and ready to drive real, tangible results for your company!

REFERENCES

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4. <http://www.bcpe.org/page/scope-of-practice>

CONTACT AON

Contact Aon's Ergonomics Group for help in developing value propositions, success/ROI metrics or lean strategies for your ergonomics program.

Vicki Missar

Associate Director

AGRC

+1.469.867.6196

vicki.missar@aon.com