

Raphael - Using HFE in a Call Center - April 6, 2008

Using HFE to Enhance Physical

Comfort of Call Center Staff

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ABSTRACT

In a call center, having happy customer service representatives is critical to having satisfied customers. Satisfied customers buy more over time which leads to an increase in company revenue. As part of an on-going company strategy to increase the satisfaction of our customers and employees, Isagenix decided to explore and resolve issues that cause call center employees to be dissatisfied with their workplace. This project was created to evaluate the level of call center employee satisfaction with the physical comfort level of their workplace. After identifying areas of dissatisfaction, root causes were analyzed and Human Factor Engineering countermeasures were developed to alleviate or eliminate discomfort factors. Additional objectives were the development of short and long term plans to train and empower call center employees so that they may resolve physical discomfort factors as they arise in the future.

This project will identify the physical discomforts experienced by Isagenix call center representatives and promote standard HFE countermeasures to alleviate the discomforts.

The most costly work related injury in an office setting is musculoskeletal disorders (MSD) due to repetitive use of tools, including keyboards (National Institute for Occupational Safety and Health [NIOSH], n.d.). Wrists are most commonly affected, having 68% of the total of repetitive disorders; shoulders have nine percent, and the back has seven percent (NIOSH, n.d.). When MSD due to repetitive tool use strikes, it causes a myriad of symptoms including pain, numbness/tingling, and sleep problems. The median time a worker will be off due to the disorder is 17 days (NIOSH, n.d.).

It is well known within the customer service industry that happy customer representatives are a vital part of keeping customers happy. Unhappy employees ultimately cause unhappy customers: it is just a matter of time. FedEx studied this phenomenon and learned they only had a two month window to reverse employee unhappiness before customer dissatisfaction levels rose. (Evans & Lindsay, 2008, p. 268). Given the short time frame for a company to fix employee dissatisfaction, it is easier to prevent it by eliminating or reducing reasons for an employee to be unhappy. Giving an employee the opportunity to express opinions and the power to change things increases their satisfaction with an employer (Evans & Lindsay, 2008). In an effort to have happy, productive employees and a healthy workplace, a project was created to meet the following objectives:

1. Survey the call center employees about their physical comfort levels and overall satisfaction with their workspace.
2. Using the survey results, identify common workplace discomforts that could be alleviated or eliminated with Human Factor Engineering (HFE) countermeasures.
3. Educate the staff on ways to prevent or alleviate discomforts identified in the survey.
4. Involve all title levels including Managers, Supervisors, and Representatives in the responsibility and ownership of workplace safety.
5. Reevaluate the effectiveness of training and employee satisfaction by issuing the same survey two and six weeks after completion of the training.
6. Design a program that provides continuing support of education about HFE countermeasures.

BACKGROUND

Worker, Environment and Workstation

The call center at Isagenix currently has sixty Customer Representatives that work forty hours a week in a large room filled with cubicles. Representatives range between 95 to 250 pounds in weight and between five and six feet tall in height. Customer Representatives spend approximately eighty percent of their day talking with customers on the phone and entering data into a computer. The remainder of their day is spent in meetings or working on special projects. Special projects generally require the employee to work at a desk or table. Most projects involve typing, writing and phone work.

Employees spend their day in an open, high-ceiling room lit by hanging florescent lights. There are no windows that let natural light in. They work in six by six foot

cubicles with walls that are four and a half feet high. The desk height is fixed at 28.5 inches above the ground. Each cubicle has a phone with a wireless headset, keyboard, mouse, one or two monitors, computer CPU, chair, accessory holder, drawers and a shelf for holding files and papers. The vast majority of cubicles do not have adjustable trays for holding files and papers. Monitor anti-glare screens, desk lamps and footrests are available as needed, but are not considered to be part of a standard desk set-up.

There are many different brands of chairs used in the center. All chairs have at least five rolling wheels and are adjustable in height.



Figure 1 Chair types.

Dependent upon the chair, the arm height and the tilt in the back may or may be adjustable. Large rubber-like “ball” chairs are available for staff on a rotating basis.

While the cubicle set up is the same for each employee, computer accessories such as the mouse, number of monitors and keyboard style are varied throughout the center. The lack of standardization of computer accessories is generally



Figure 2 Example of two cubicles

recognized as being a good thing as chairs, keyboards and mice are often swapped amongst new employees until they find one that works best for them. Split keyboards, vertical keyboards, special chairs or other equipment is only purchased if a doctor has prescribed them.

Training and Social Support

Other than touching on the subject of workstation safety at employee orientation, there is no current system that evaluates the potential for call center injury due to work-related musculoskeletal disorders or environmental factors. Nor is there is a training program for ergonomics or HFE countermeasures. There is social support as representatives are placed into teams for their general work. These teams have daily meetings of fifteen minutes or less. As Isagenix prefers to hire people with one to two years of call center experience, all teams have at least one member that has experience with other call center HFE countermeasures.

Risk Management Approach

Isagenix has grown very rapidly since it began six years ago. During that time the call center has been moved once and will move again later this year as it will outgrow space by the end of 2008. To date, Isagenix has been fortunate in having no identified injuries in the call center. As a major renovation of the call center will occur in the fourth quarter of 2008, Isagenix would prefer not to invest heavily in desks or items that will be changed during the renovation. With this in mind, all HFE countermeasures were evaluated using a cost and risk management approach before being implemented.

METHODOLOGY

Management knew very little about employee's physical discomforts while at work. Complaints were either being ignored or were not voiced aloud as being a problem within the call center. As part of an overall company strategy to empower employees and to promote quality methods, it was decided that management would poll the call center employees and then have them work in teams to resolve any identified issues. A survey was created that asked 15 questions about common safety issues in call center settings. These issues were primarily focused on symptoms of work-related MSD and a general evaluation of environmental factors. Representatives were surveyed, using a third-party internet-based survey company. The survey was anonymous unless the employee chose to identify themselves. Of the 60 surveys that went out, 58 were completed and returned. Based on the survey, discomfort factors, in descending order, were the (a) chair, (b) computer and desk set-up, (c) lighting, (d) temperature, and (e) odor. Survey results are in the Appendix.

ANALYSIS OF CAUSATIVE FACTORS

When these physical discomfort factors were reviewed for root causes, it was determined that most of the staff did not know how to adjust a chair, computer, desk set up, and lighting; nor did they know the process for changing their current workspace accessories or environment.

HFE COUNTERMEASURES

Interventions focused on development of HFE countermeasures, training, and empowering staff to address causative factors identified in the survey. Multiple countermeasures were defined for the causative factors. From this work, a class outline was created as a teaching tool. Training goals were (a) to get an employee to be more aware of the body and its comfort level, (b) to teach HFE countermeasures that would alleviate or prevent the identified discomfort factors, (c) encourage and empower staff to resolve their issues, and (d) create a team structure that would support organizational learning about work related issues causing discomfort and their countermeasures.

Class Outline to be Accompanied by Slides

What are the Goals of this Course?

The goals of the classes is to (a) show the results of the discomfort survey, (b) show students how to work using neutral postures in the body to prevent poor work practices with special emphasis on working on the phone while at a computer desk, (c) demonstrate how to correctly set up an office chair, (d) teach the importance of stretching to overall health, and (e) teach students how to watch for and identify poor work practices in themselves and others.

What Causes the Discomfort?

A summary of call center survey results shows the primary causes of staff discomfort are caused by the chair, computer and desk set-up. Secondary causes are the lighting and room temperature. Tertiary causes are odors and workload stressors.

How can you Prevent Discomfort?

Review your workstation. A well organized workstation increases your productivity and helps prevent muscle strain. Set up your workstation correctly (Kroemer, Kroemer & Kromer-Elbert, 2001) using these guidelines:

1. Clear the clutter by reducing unnecessary paper and personal items. Create enough space so that you can comfortably write.
2. Keep electrical cords neat and out of the way by tying them off with Velcro straps.
3. Use your wireless headset. If you use your phone hand piece, avoid holding the phone with your shoulder.
4. Have your tools and paper close at hand, usually with 18-24 inches. Consider whether or not you have to bend or twist to reach something. If so, consider changing the position of your tool.
5. Review your chair, keyboard, mouse and monitor set up. If any cause you discomfort, consider trying a different brand. (See your Supervisor.)
6. Keep your mouse close to your keyboard so that you do not have to reach for it.
7. As a general rule, your monitor should be about an arm length away from your eyes. You should be able to see the type without having to lean forward, but you do not want it to be so close it causes eye fatigue. Adjust top height of the monitor screen to or just below eye level.
8. Use the monitor's contrast controls and slightly tilt down the monitor screen to reduce glare from overhead lights. Consider using anti-glare screens and desk lamps to prevent excessive glare or to provide extra light. If using a desk lamp, position it directly on work documents.

9. People that use bi- or trifocals may need different glasses while working on the computer.
10. To keep screen characters crisp and readable, frequently clean the monitor for dust.
11. If you enter data from a piece of paper, consider using a document holder to reduce muscle fatigue and strain in the shoulders, neck and eyes. The document holder should be at the same level as your monitor.
12. Maintain plenty of knee and leg space beneath your desk.
13. Make sure your desk and chair do not “cut” into any part of your body. Forearms, back of the knees and thighs and stomachs are most common areas feeling the “cut”.

Use neutral body positioning. Learn how to keep neutral body positioning while at a desk (J.J. Keller and Associates, Inc., 2008).

1. Face computer station with legs, torso and head facing in the same direction. Your head should not be tilted up when viewing your screen or document.
2. Keep shoulders and body relaxed.
3. Pen or pencil grips may relieve hand tension for those that must write a lot.
4. Consider how hard you grip the mouse. Relax your hand and use the mouse as gently as possible.
5. Consider how forceful fingers pound on the keyboard. Type gently. Rest the hands, wrists and arms when not typing.
6. Keep forearms, wrists and hands in-line while typing. Consider using the keyboard feet to tilt the keyboard forward or backward to facilitate keeping the wrists in-line.
7. Tighten stomach muscles to safeguard lower back. Shifting your weight from side to side, while standing or sitting, may also reduce pressure on the lower back.
8. Keep your body in-line or move your chair if you must reach for something.

9. Stand up to move or pick up items on the desk shelf that resided above your head.

Learn to frequently adjust your chair. Using various office chair styles, the teacher will demonstrate how to correctly adjust a chair (Canadian Centre for Occupational Health and Safety, 2008).

1. Adjust your chair height so that your forearms are correctly positioned using a keyboard. Arms should hang directly down from shoulders with elbows close to body and at a 90 degree angle to floor. Hands, wrists and forearms should be in-line with one another.
2. Position the tilt of the chair back at a comfortable angle.
3. Adjust chair to fully support your lower back as you sit straight up. Consider using a lumbar pillow if needed.
4. If using chair arms, position them so that your forearm and elbow will just touch the arm surface when seated comfortably with elbows bent at 90 degrees.
5. Have knees bent at 90 degrees with feet flat on the floor, slightly ahead of the knees. Change feet position often. Use a foot rest if the feet cannot rest flat on the floor.

Exercise can reduce fatigue, stress and tension. These exercises can be done while standing or sitting at your desk. Hold each of these exercises at least 5 seconds before going onto the next.

1. Neck stretch. Slowly bend left ear to left shoulder. Repeat on the right.
2. Back stretch. Grab hips, stretch back up and stomach out toward the front to arch back muscles. Reverse stretch by hunching should toward front and arching back as if you were a cat stretching.
3. Power stretch. Keep head in line with torso. Flatten back and bend at waist 90 degrees to the floor. Keep knees slightly bent.
4. Shoulder stretch. Grab bent right elbow with left hand. Gently pull elbow in toward opposite shoulder. Repeat on the other side.

5. Hand exercises (Seradge, 1998).
 - a. Put hands straight out at shoulder level with palms facing forward and fingertips up.
 - b. Keeping arms in same position straighten hands and allow fingers to relax.
 - c. While keeping the same arm position, clench your fist.
 - d. Allow your fists to drop down toward the floor, keeping your arms at shoulder height.
 - e. Unclench fists, straighten wrists so they are in-line with the forearms and allow your fingers to relax.
 - f. While standing, with your arms at side of the body, relax the shoulders, arms, wrists and hands.
6. Blink often as it helps to keep the eyes moist and it can reduce fatigue. Every half an hour, focus on something at least 20 feet away from your screen. Focusing outside your work area reduces eye fatigue.
7. Move often. Reposition your chair, stand up, sit down, and use the “ball” chair. Remember there is no single healthy position that will work beyond about 20 minutes.

Take Ownership. Identify and address causative factors of discomfort.

1. Wear layers of clothing so that you can be comfortable wherever you sit. You're your supervisor order a personal fan if your area is too hot.
2. Report broken headsets and unnecessary noise.
3. Ask Supervisor for odor absorbing gel if your workspace has an unpleasant odor.
4. Assist your co-workers in recognizing actions or conditions that could cause physical discomfort.
5. Stretch with your team as well as on your own.

6. Support your team's weekly efforts to identify and fix root causes of discomfort.
7. When uncertain how to fix something, contact your Supervisor.
8. For additional information see the Computer User's Handbook (American International Group, Inc., n.d.) available in the call center resource area.

Employee Empowerment and Continuing Education

Additional interventions were designed to empower staff and continue to raise the level of awareness about preventions for work-related discomforts.

1. After training, Supervisors would implement weekly conversations on physical comfort to further raise employee awareness of the subject. All supervisors agreed to spend at least 5 minutes in one of their daily group meetings to ask these questions (a) What physical discomfort did you experience this week?, (b) What solutions could the group create to address the issue? (c) For those items discussed last week, did the physical discomfort go away?, and (d) If not, what can be changed to resolve the issue?
2. Daily team stretches would be implemented. The team leads would be responsible for having their team stand up and stretch at least once every hour. Teams completing their hourly stretches would be recognized by the Manager at the end of the day during the six weeks following the training. Stretches taught in the class would be used as a baseline for initial work. Teams could modify their stretches as needed.
3. Using information from the training class and outline, Supervisors would train new hires on the correct way to set up their workstation. Each new hires would then be placed with a team for weekly discussions of work behaviors.
4. The second and third surveys at two and six weeks after training, respectively, would be the primary means of determining the effectiveness of the program. Both surveys would be evaluated to determine what changes needed to be made to the training program or class.
5. Following the third evaluation, a survey on physical discomfort would be distributed every six months. Dependent upon the results from the survey, a second set of classes might be taught in Fall 2008. As part of a continuing educational program an annual refresher course would set up for 2009 and beyond.

POST INTERVENTION RESULTS

Training was delayed due to an unexpected call volume resulting from a computer programming issue. It was determined that this project would be put on hold until the issue was resolved. Training is now scheduled for the second and third weeks in April.

While one might expect training to reduce the incidence of dissatisfaction, the secondary survey will probably have results similar or worse than the first survey only because the first survey and training will have raised the level of awareness about physical discomfort. Raising awareness would cause a corresponding increase in dissatisfaction on the survey due to go out two weeks after the training. As time passes, and people are able to implement what they have learned, the dissatisfaction levels are expected to drop. The third survey, now slated for mid May, is expected to show a decline in all areas, with the exception of noise. It is expected that the upcoming renovation, which begins in May, may create issues with noise levels.

CONCLUSION

The objectives of this project was to identify the physical discomforts found in a call center, document and train HFE countermeasures and study the effectiveness of the countermeasures in alleviating the identified discomforts. While this project is not yet complete, it has identified the major causative factors of physical discomfort in the call center. It has identified, documented and composed countermeasures for the major

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causative factors. Finally, short and long term training programs for staff were designed and planned into the training calendar.

REFERENCES

- American International Group, Inc. (n.d.) *Computer user's handbook*. [Brochure]. Workers' Compensation Department/AIG Consultants. New York: Author.
- Canadian Centre for Occupational Health and Safety (2008). *How to adjust office chairs*. Retrieved March 5, 2008 from the Canadian Centre for Occupational Health and Safety Web site:
http://www.ccohs.ca/oshanswers/ergonomics/office/chair_adjusting.html
- Cohen, Alexander L., Gjessing, Christopher C., Fine, Lawrence J., Bernard, Bruce P., & McGlothlin, James D. (March, 1997). *Elements of ergonomics programs a primer based on workplace evaluations of musculoskeletal disorders*. (Publication No. 97-117). U.S. Department of Health and Services National Institute for Occupational Safety and Health Publications Disseminations Cincinnati, OH.
- Evans, James R. & Lindsay, William M. (2008). *Managing for Quality and Performance Excellence* (7th ed.). (pp. 268), Mason, OH: Thompson Higher Education.
- J.J. Keller & Associates, Inc. (2008). *Desktop ergonomics*. Retrieved March 5, 2008 from the J.J. Keller On-line Web site: <https://www.kelleronline.com/topics/topicinfo.aspx?topickey=1042&doctype=1&pagekey=103929&linktype=1&linkdata=103932>
- Kroemer, K., Kroemer, H., & Kroemer-Elbert, K. (2001). Ergonomics how to design for ease and efficiency. In W.J. Fabrycky & J.H. Mize (Eds.), *Prentice Hall international series industrial & systems engineering* (2nd ed., pp. 1-695). Upper Saddle River, NJ: Prentice Hall Inc.
- National Institute for Occupational Safety and Health. (n.d.) *National occupational research agenda for musculoskeletal disorders*. Retrieved April 5, 2008 from the Centers for Disease Control & Prevention Web site:
<http://www.cdc.gov/niosh/2001-117a.html>
- Seradge M.D., Housang. (1996). *Carpal tunnel syndrome exercises* [poster exhibit]. Retrieved April 5, 2008 from the E-hand.com The Electronic Textbook for Hand Surgery Web site: <http://www.eatonhand.com/hw/ctexercise.htm>

APPENDIX

Table 1A

Call Center Survey Results on Physical Comfort Levels

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The cleanliness of the call center is acceptable.	0.0%	6.9%	10.3%	51.7%	31.0%
The scent of the call center is acceptable.	3.4%	10.3%	20.7%	48.3%	17.2%
The lighting in the call center is appropriate for completing my work.	13.8%	31.0%	17.2%	17.2%	20.7%
My work station is conducive for me to perform my job responsibilities.	6.9%	13.8%	17.2%	41.4%	20.7%
The temperature of the call center is comfortable. Please note in the comments section below if the temperature is: too cold, or too hot & cold, or too hot.	10.3%	20.7%	24.1%	31.0%	13.8%
			too cold	both	too hot

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(only 31 % of total responded to this question)		22.2%	33.3%	44.4%	
Isagenix staff encourages me to routinely stretch throughout the day.	17.2%	34.5%	27.6%	3.4%	17.2%
The cables for my PC and telephone are neat looking and out of the way.	6.9%	13.8%	27.6%	31.0%	20.7%
My computer screen is adequate for job requirements.	0.0%	6.9%	17.2%	41.4%	34.5%
My chair has settings so that I can personalize seat height, chair back and arm rest height.	10.3%	27.6%	10.3%	31.0%	20.7%

	Very Dissatis- fied	Dis- satisfied	Neutral	Satisfied	Very Satisfied
How satisfied are you with Isagenix training given on how to customize your chair and the placement of your computer, phone and work tools for maximum comfort?	24.1%	20.7%	31.0%	17.2%	6.9%
How satisfied are you with the physical comfort of the call center?	0.0%	13.8%	44.8%	27.6%	13.8%
Call Center Survey Results on Physical Comfort Levels (continued)					
	0	1-2	3-4	5-6	7 & up
Identify the average number of times per week you experience headaches while at work.	20.7%	37.9%	37.9%	3.4%	0.0%
Identify the average number of calls per day where you cannot hear your customer due to the surrounding noise.	37.9%	41.4%	10.3%	10.3%	0.0%

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	0	1-2	3-4	5	5+
Identify the average number of times per week that you experience arm, neck or shoulder pain by the end of day. (answers 0, 1-2, 3-4, 5,5+)	20.7%	31.0%	17.2%	10.3%	20.7%

Our goal is to provide the highest quality surroundings to ensure employee satisfaction. Please take a moment and share with us how we can most effectively meet your needs.

Response Subject	%
fix chair	32.3%
fix light	12.9%
fix keyboard	12.9%
all is good	12.9%
too much work	9.7%
fix A/C	6.5%
fix noise	3.2%
electrical cords messy	3.2%
fix headset	1.6%
fix odor	1.6%
good odor	1.6%
want a walking station	1.6%