SITTING PRETTY, SITTING HEALTHY

A GUIDE TO OFFICE CHAIR SELECTION AND USE

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INTRODUCTION

Ergonomic chairs are foundational in today’s knowledge-based workplace. Yet, office chairs are highly undervalued, under-appreciated and misunderstood relative to their counterpart, the computer. Employers need to recognize and value the critical link ergonomic chairs have in fostering productivity and comfort in today’s modern workplace. Yet, I’ve seen time and time again poor quality chairs, incompetent, failing chairs, and poor fitting chairs assigned to employees without any thought or consideration to fit, function and comfort.

Employers need to start first with investing in the right chairs; correctly identifying and selecting the most appropriate chair for the work performed and the end users who will use them. Understanding the fit of ergonomic chairs followed by providing education to chair users so they know how to use their chair for maximum benefit is essential.

Bad chairs may be a major driver in the sit to stand trend revolutionizing the way we work. Millions of office workers sit 7-12 hours a day in ill-fitting chairs. In fact, I think it is a significant driver in the latest sit-to-stand trend. Ask anyone about their ergonomic chair and most likely they won’t know how to adjust anything other than the height. This results in a poor fit and awkward postures which ultimately leads to musculoskeletal discomfort associated with seated work tasks. Thus, ergonomic chairs are a major contributor to seated work injuries costing employers 50-80 times the investment of a good ergonomic chair!

After 26 years in the ergonomics profession evaluating thousands of seated workers’ in their chairs at their workstations, I’ve concluded, “It’s not intuitive to know how to select, fit and adjust an ergonomic chair”. We just don’t understand how to select the right chair, sit correctly and benefit from the mechanics of a good ergonomic chair.

In my first e-book, “Sitting Pretty, Sitting Healthy: A Guide to Office Chair Selection and Use”, I begin with exploring the importance of the ergonomic chair in the workplace by looking at chairs as an asset or a liability in Chapter 1. In Chapter 2, I identify the top 15 best criteria to select an ergonomic chair. In chapter 3, I delve into the controversial topic of whether to provide and use armrests or not. This e-book provides an initial overview of a hidden epidemic that has “flown under the radar” far too long. It’s time to raise our chairs to the level of importance they deserve!

Share your chair experiences with me by leaving a comment. To learn more about your chairs, register for our Chair Assessment and Fit training and start managing your chairs as a valuable asset in your workplace. You’ll be “sitting pretty” once you do!
Chapter I
Are Your Ergonomic Chairs An Asset Or A Liability?

Do you know what you’re sitting on these days at work? What if the chairs your organization provided could give you a boost in energy and productivity? Or on the flip side, contribute to your aching back or neck? How would you know and what would you do? I’ve evaluated thousands of ergonomic chairs in my career and I’ve come to the conclusion that often the chairs that employers’ purchase directly relate to employee discomfort, distraction, and productivity loss contributing to many seated work injuries, and the recent interest in the desire to stand at the office.

Ergonomic chairs are one of the most important capital assets an employer has that directly contributes to productivity and the bottom line. In fact, without a comfortable, functioning chair, your workforce has a difficult time being productive at a computer in the seated work environment. Yet, ergonomic chairs are often not selected based on employee anthropometrics (human measures), are not part of a preventive maintenance program, or part of a life cycle asset management program to optimize their performance and ultimately your employees. Furthermore, how do you know when a chair has passed its peak performance, is at the end of its life cycle and is no longer providing value in the workplace?

In my experience, I have seen chairs become a significant liability contributing to the high cost of seated work because they are so poorly maintained, don’t fit properly, lack adjustability and/or they are no longer supportive. We’re talking about an average cost of $41,000 - $55,000 per workers’ compensation claim based on the latest data from the California Commission on Health, Safety and Workers’ Compensation.

Chairs are mechanical by nature and as such are prone to breakage and failure. Sinking cylinders, failing seat cushions, exposed and torn armrests, torn fabric with unsightly stains, broken casters. Chairs don’t last FOREVER! What is the message you are giving your employees when you don’t maintain your chairs or provide good ergonomic seating with enough adjustment to effectively support the spine, buttocks, legs and upper extremities?

Just take a look around your office. Do you see employees covering chairs with padding, cushions, lumbar supports or even blankets? Are employees asking if they can sit on a “ball chair”? These are signs that your chairs just aren’t working well for your employees; not enough support, poor fit, even unsanitary. Employees often wind up playing “musical chairs” when their chair becomes intolerable or breaks, pushing them into a hallway or an empty cubical only for it to be picked up by another unsuspecting employee! Sound familiar? Chairs are a valuable asset in the workplace... Treat them as such! Implement a chair asset management program to include selection, preventive maintenance, replacement and fit.
Selecting ergonomic chairs for a diverse workforce is not easy to do. I find most employers, including purchasing managers or in-house ergonomics support tasked with selecting and purchasing ergonomic chairs often choose poorly. Primarily because they don’t use good criteria to select from or know where to find the criteria. Many select chairs based on the lowest price which is a recipe for failure! With sitting time increasing for most of us to 7 or more hours a day in the office, investing in comfortable, supportive ergonomic chairs as a capital asset is a must!

The Business and Institutional Furniture Manufacturers Association (BIFMA) put out the BIFMA G1-2013, “Ergonomic Guidelines for Furniture Used in Office Work Space Designed for Computer Use”. This guide is updated from the 2002 recommendations and provides guidance in specifying chair and other furniture selection criteria. As a result, chair manufacturers are encouraged to design products to meet the 2013 standard. In the meantime, employers with older chairs will not meet the new criteria resulting in a less than stellar fit of their workforce. Another useful guide related to the one sited above is the “BIFMA Ergonomics Guideline Ultimate Test for Fit.” This brief guide offers guidance in chair fit, work surface and monitor placement in a summary format.

Over the years, I have conducted hundreds of chair fittings. I use these guides to measure and fit employees to identify the best fitting chair available as part of my client’s standards or in the marketplace. When employees participate in the chair selection and fit process, the accuracy in identifying the best fitting chair goes up substantially, resulting in a 99% satisfaction rating by users. Furthermore, the end user has an opportunity to learn how to adjust the chair for best comfort during the fitting process. This results in long term value once the chair is installed.

Figure 1. Conducting a chair fitting while measuring for popliteal height.

“Ultimately, proper chair selection reduces the likelihood of a seated work injury claim (average cost of $39,000 based on 2015 WCIRB data).”

Selecting chairs in the workplace to match the BIFMA guidelines as much as possible is a great way for employers to provide maximum seated comfort, thereby minimizing musculoskeletal complaints related to sitting in a poorly fitted chair. Ultimately, proper chair selection reduces the likelihood of a seated work injury claim (average cost of $39,000.00 based on 2015 WCIRB data).
THE 15 BEST CRITERIA TO SELECT ERGONOMIC CHAIRS (CONT)

Based on experience, I’ve listed my top 15 chair fitting criteria to help with proper chair selection and maximum fit for a diverse workforce. Chairs should have the following features for best fit of the individual and to fit a majority of staff. Selecting chairs with these features will give end users the options to sit in neutral, forward or reclined positions through the day.

1. Seat height: 5” range 16”-21” for smaller; 17”-22” for taller.
2. Seat pan depth adjustment 2” to slide out seat pan.
3. Back height adjustment for better lumbar support: Mid back for smaller; high back for taller.
4. Assure good lumbar contour to support a moderate lordosis; adjustable lumbar helpful.
5. Armrests: at minimum height (4” range of 7”-11”H) and width adjustment; for best fit 4 way: height, width (into seat pan), pivot and forward/back movement.
6. Seat back angle for recline or upright adjustment- manual, independent adjustment.
7. Seat pan tilt for recline or decline (forward sitting) – manual, independent adjustment.
8. Tilt tension for #6-7, preferably in an easy to reach position (side of chair, not underneath).
9. At minimum, chair should go from neutral to recline; forward tilt helps smaller individuals reach higher surfaces.
10. A chair that reclines and moves forward with the user without requiring manual adjustment, synchronous option.
11. Casters appropriate for carpet or hard floor depending on floor design.
12. Seat width of 20” (will be too wide for petite individuals; too narrow for large individuals)
13. Be mindful of the end user's seated work postural preferences (blog for another day!).
14. For a diverse workforce, select at least 2-3 chairs to fit the 5th-95th percentile; at least 1 petite chair for 5th percentile or less and 1-2 chairs for the 95th percentile or greater.
15. Employee must like the chair after fit, understand how to use it and find it comfortable following adjustment.

Using my list of 15 selection criteria is a recipe for success in fitting a majority of your employees comfortably into the best chair.

Once employees are in the right chair, there is no awareness of discomfort or poor fit as the chair and user become “one” with the world!
Perhaps one of the most controversial ergonomic actions in the workplace is whether to use armrests or not. I see many employees with chairs that previously had armrests but now do not. When I ask where the armrests are, the employee typically states, ”The last ergo evaluator told me to remove them.” To which I ask if that was helpful? Typically, employees report continued problems despite this action.

The question is why remove them? Is it necessary or helpful to use armrests with computer use? Is it bad to use chair armrests? There are many myths and half truths around the use of armrests. In this blog, I separate fact from fiction and help identify whether armrests are truly helpful or harmful.

Historically, armrests have been on chairs for hundreds of years. Think back to the thrones of the Royal Family, where their typical sitting posture always included the use of armrests to rest the upper extremities. Typically, the Board of Directors all sit at the board room table in chairs with armrests. Or the chair at the head of a table often has armrests. In these cases, armrests act as status symbols for executives or the head of the household. So, if they are bad for us, why would we be using them for so long for hundreds of years ingrained in our culture?

Recent research in the last 25 years has validated the importance and use of armrests at a computerized work station. The research is quite clear on the value of armrests and in my clinical ergonomics experience, they are critical and important in the prevention of musculoskeletal disorders to the upper extremities. But there is one caveat…THEY MUST FIT TO BE BENEFICIAL!

The research cites a number of studies justifying the benefit of armrests with computer use.

Peter Opsvik, a Norwegian industrial designer best known for his innovative and ergonomic chairs and author of “Rethinking Sitting” articulates in his book, “how when we are seated, our arms require both freedom to move and lots of opportunities for support.” He further states three primary reasons why our arms need support:

1. To ease the load placed on the back by the weight of our arms and hands.
2. If we are to use our hands to carry out an activity, some form of support can in many cases reduce the strain on the muscles that results from holding our hands in the area where the activity is to be carried out.
3. Having support for our hand and underarm can also provide more strength and precision for the work that is to be done.

Mr. Opsvik also states too much support can also lead to passivity and can be detrimental. “When we sit we instinctively try and find a place to put our arms and if we don’t have armrests, we use our laps. But if the chair has armrests, these are a natural place to find support.” He recommends the support be vertical beneath our shoulders to take body weight off of our backs.
In another study by Rani Lueder, “Impact of New Input Technology on Design of Chair Armrests: Investigation on Keyboard and Mouse”, from the 1996 Proceedings of the HFES Annual Meeting, the study investigated the effects of a mouse input device on the design of chair armrests. This study found height and rotational adjustable armrests provide superior forearm support during mouse use. For keyboard work, armrests reduced neck and shoulder fatigue. This finding validates Mr. Opsvik’s findings above in statement #2 and #3. Mouse use is a precision task and benefits from forearm support for better hand accuracy.

In 1999, Ms. Lueder also wrote with Paul Allie in “Chairs with Armrests: Ergonomic Design Issues”. In this review, Ms. Lueder identifies a number of important reasons to use armrests.

- Armrests relieve loads on the neck, shoulders and arms.
- Armrests may help promote good postures.
- Armrests alleviate stress on the back by reducing about 10% of user’s body weight.
- Armrests alleviate stress on the lower limbs and help to facilitate rising from a chair cutting hip forces in half.
- Armrests help prevent excessive pressures on the seat.
- Armrests stabilize posture and help us do our work.

Dr. Alan Hedge of Cornell University wrote in 2002 for “Work Healthy” online newsletter further reiterating the benefits of chair armrests by noting how armrests can reduce the static loads on muscles of the neck, back, shoulders and arms especially when the arms are extended forward or abducted sideways. He also states that finger forces are lessened when a user’s arms are supported while keying. Dr. Hedge concurs with Lueder’s findings that chair armrests help to stabilize the body when seated and are critical in rising from a chair to reduce knee and hip joint muscle forces.

Dr. Hedge also suggests with keyboarding and mouse use, armrests are not a substitute for a good quality keyboard tray system. It is acceptable to occasionally rest the arms at the elbows but be cautious of resting the forearms on the armrest for any prolonged period of keying and mouse work because this can compress the finger flexors or ulnar nerve. Armrests should be used for intermittent, light support with these tasks.

In one final study I want to point out by Fred Gerr in 2004, “Epidemiology of musculoskeletal disorders among computer users: lesson learned from the role of posture and keyboard use” states, “It appears that lowering the height of the keyboard to or below the height of the elbow and resting the arms on the desk surface or chair armrests is associated with reduced risk of neck and shoulder MSDs”.

Now that you know the facts on armrest use, I’ll return back to the comments from the audience last week. It might be the person asking me about armrests had not been exposed to a chair with good fitting armrests. That’s because, in my opinion and experience, most employers aren’t buying chairs with armrests that fit even
50% of their workforce. So they remove them. If armrests are fixed in position or limited in height, width, and/or pivot, then they most assuredly won’t fit correctly and can’t be used properly by a majority of employees resulting in awkward side leaning or interference so often reported. When this happens, the most reasonable action is to remove them eliminating any possible benefits reported.

The bottom line is fully adjustable armrests (height, width, pivot and forward/back glide) on a good ergonomic chair are an important part of an ergonomically correct work environment promoting a healthy and productive workforce.

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“"We really appreciated your Chair Assessment Training primarily the hands-on part and demonstration on conducting the chair measurements and explaining the purpose for each measurement. We also appreciated your passion and expertise. Thank you!”

Maria Hoyos-Moya
Loss Control and Prevention Specialist

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