

## **Ergonomics Update: Why Women Are at Greater Risk**

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### **Introduction**

Women in the workplace suffer a disproportionate number of many types of ergonomics related injuries, particularly when insufficient attention has been paid to the design of work, equipment, workstation and environment. The biological and physiological characteristics of a female can present different risks for musculoskeletal disorders from the male. In this presentation the differences and how they need to be addressed to provide a safe and healthy work environment for women in industry and the office will be discussed. Topics will include an overview of musculoskeletal disorders involving women, job hazard/risk factor analysis and control or prevention through medical management, fitness/exercise, posture and body mechanics.

At all stages of their working careers women are more likely than men to work part-time, be in lower status jobs and earn less than men. Poorly paid work that is demanding yet offers little control is the most psychologically and perhaps physically stressful. Some female dominated professions like health care require moving heavy loads and adopting awkward working postures while office work requires high levels of static muscular contraction. Women are also more likely than men to be performing work that involves repetitive tasks, working at workstations and using tools that were designed for men. All four issues, force, poor posture, static muscular contraction and repetition are known risk factors for musculoskeletal disorders.

Alongside the physical hazards in the workplace women more commonly face risks at home, as well. Activities still more often performed by women than men include lifting heavy children and groceries, moving dependant adults and performing repetitive tasks like cooking, cleaning and other house keeping chores.

### **Women More Prone to Musculoskeletal Disorders (MSDs)**

Women are at least two (2) times more prone than men to develop MSDs of the upper body according to Ohio State University Scientists. Some researchers suspected that women were more likely to admit pain and seek treatment. Conventional wisdom held that men do physically demanding work leading to back pain and women do fine, repetitive work that leads to neck, shoulder and wrist problems. This study showed women more likely than men (2 to 11 times) to develop MSDs even when both have the same job. Researchers believe the reasons are a combination of biomechanical, physiological, psychological and other factors.

### Why Are We Seeing an Increase in MSDs in Women?

Many reasons have been evaluated when trying to establish a cause for the increase in MSDs in women as well as the population in general. Some factors that have been proposed as related to this issue include:

- Decreased level of physical fitness
- Aging workforce
- Increased work load
- Obesity issues
- Psychological stresses (Work and Home)
- Change in work ethic
- Better educated on MSDs
- Static work and home postures
- One size fits all in job, home and recreational activities

### Health Care Expenses in the United States

Health care expenses increased from \$1.4 trillion dollars in 2001 to \$2.1 trillion in 2006. Annual increases are predicted to be 7.3% by Medicare and as much as 15-17% by private agencies. The actual increase was 14.4% in 2002.

In most states worker's compensation costs exceed that of group health insurance. In 2003 General Motors Corporation spent \$4.8 billion dollars on health care expenses for 195,000 workers and 450,000 retirees. GM states that healthcare costs are the biggest obstacle for competing with foreign companies.

### Our Aging Workforce and Statistics on MSDS for Women

In 1972 the average age of an employee in the United States was 28. In 2006 the average age of our workforce was 46. Some of the differences between a 28 year old and a 46 year old could include decreases in strength, endurance, flexibility, reaction time and eyesight.

Women are 46% of the workforce and experience 33% of work related injuries and illnesses but report 63% of MSDs that result in lost work time. Women report 70% of carpal tunnel syndrome and 62% of tendonitis that results in lost work time. MSDs account for 50% of women's lost work time injuries. Women have been 86% of the repetitive motion injuries and 78% of the tendonitis increases since 1996.

### Women Obesity and MDSs

Weight to height ratio or body mass index (BMI-a ratio of weight to height squared), and obesity have all been identified as potential risk factors for MSDs, especially carpal tunnel syndrome (CTS) and lumbar disc herniation. Obese patients (BMI>29) were 2.5 times more likely than slender patients (BMI<20) to be diagnosed with CTS.

Other chronic diseases linked to obesity include osteoarthritis, type 2 diabetes which increases the risk for CTS and sleep apnea which increases fatigue and therefore chances of accidents and errors.

Back pain can be contributed to by being over weight. Being over weight increases wear and damage to joints, irritation and pain and reduced activity. This lack of activity can cause further weight gain. Back problems can also result from inadequate nutrition. Not consuming the correct nutrients can cause chemical changes that weaken structures, increase fatigue and slow or prevent your body from healing.

Hagman and Wegman found that neck and shoulder pain is more common in females than males in the general and work population. Ulmin noted postural differences at work were related to stature. Lack of workplace accommodation to height and reach may also play a role since most tools and workstations are designed for men.

Use of tobacco products is also related to increased risk of MSDs. 20.9% of the adult population used tobacco in the US in 2005 according to the CDC. 23.9 % was male and 18.1% female. Use of tobacco causes coughing to increase which in turn increase abdominal and intradiscal pressure. Other related issues include that nicotine induces diminished blood flow and mineral content of bones causing microfractures. Diminished blood flow increases the risk of Reynaud's disease or arm-hand vibration syndrome, as well.

Osteoporosis is more of a problem for women than men. Men have greater bone mass than women at all ages. Peak bone mass for women is at age 30. After menopause women may loose 50% of bone mass. Men may loose 25% as they age. Men have greater bone mass and half the loss as they age. According to research conducted by the Women's Sports Foundation, girls that participate in weight bearing sports before the age of 12 are 60% less likely to develop osteoporosis. One way to prevent osteoporosis is by exercise as long as it is not excessive.

### Women Their Work and Their Health

Women are 46% of the workforce in the US. 60% of the total female population are employed outside of the home. In health care women represent over 80% of the workforce. Women experience 33% of work related injuries/illnesses but suffer 63% of all work related musculoskeletal disorders.

For most women in the workforce job related stress is high. Some of the issues that contribute to the stress include: hours of work, job design, scheduling, interpersonal factors, management style and the organizational climate.

### Women and Spinal Dysfunction

Just being a woman is a problem for the spine. 33% of women 16-24 years of age and 50% of women 45-64 years of age reported back pain in 2006. Women's menace cycles can trigger back pain due to the issues associated with hormonal fluctuation including osteoporosis that increases the chances of micro fractures of the spine as well as osteoarthritis.

In the US studies indicate that 50% of pregnant women report back pain and that domestic work and child care greatly increase stress on the spine. Some of the main triggers from the home environment include carrying heavy objects, gardening and vacuuming. Fashion issues such as shoes, clothing and breast implants have been associated to back pain in women.

Some of the risk factors for back pain due to pregnancy include awkward postures, forces from heavy lifting, repetition, and fatigue without rest. During pregnancy the center of gravity is

shifted forward causing postural changes and increase in forces/stress on the lumbar spine. Due to hormonal issues the ligaments are weakened making joints less strong and placing increased stress on the muscles. Stressed muscles lead to fatigued muscles and fatigued muscles lead to muscle spasm, pain and dysfunction.

Women are involved with more whiplash/cervical spine injuries for motor vehicle accidents and recover more slowly than men. 80,000 nurses injure their backs annually and 3,600 are left disabled and unable to return to work as a nurse. 44,000,000 workdays are lost each year by women due to back pain.

Only 17% of women with work related back pain had any training on care of the back.

### Summary: Why are WOMEN at Risk for Musculoskeletal Disorders (MSDS)?

#### Environmental:

1. Job site and equipment NOT designed for women
2. Temperature – Women more sensitive to extreme temperatures
3. Lighting issues
4. Noise/sound issues
5. Motor activities are more difficult for women

#### Administrative:

1. Length of work day
2. Less job and task rotation at work
3. Fewer breaks if not in a management job

### Prevention of MSDs to Women

#### Avoid or Limit:

1. Strenuous work
2. Work requiring balance
3. Heavy lifting (51- 75 pounds)
4. Loud noise
5. Shift work
6. Temperature extremes
7. Long hours (more than 8 hours per day/40 hours per week)
8. Non-adjustable workstations
9. Prolonged sitting
10. Prolonged standing

### Ideas for Reducing or Controlling Risks Factors for MSDs for Women

According to experts and OSHA the best ways to reduce or control exposure to risk factors for musculoskeletal disorders are, administrative, engineering, personal protective equipment and work practices controls.

Administrative controls decrease the duration, frequency or amount of exposure of the risk factor by job and task rotation, matching the worker to the work demands with a functional capacity evaluation (FCE), job enlargement by adding non-stressful tasks and by employer authorized ERGO breaks.

Engineering controls are fitting the job to the person by modifying and redesigning the workstations, equipment, tools, facilities, materials, processes or environment of the worksite. As we have previously noted many work areas were designed by men for men. 46% of our workforce is female. The best place to apply ergonomics principles is during design, not after the issues becomes a problem. It is much cheaper to build it correctly in the first place than to retro fit. Engineering controls should be proactive not reactive.

Personal Protective Equipment (PPE) is not back belts, wrist splints or tennis elbow straps. Such orthopedic devices may be considered medical management or treatment by OSHA. PPE for musculoskeletal disorders for women include items that will protect from contact stress like standing floor mats and shoe inserts and anti-vibration gloves.

Work practice control is safety through education. With this category of interventions the goal is to change the way a worker approaches and performs the job due to education. Such things as instruction in neutral postures, correct body mechanics and observance of ergo breaks can minimize the risk factors of the work environment.

#### Additional Ideas for Risk Reduction

Another effective way to decrease the severity and duration of musculoskeletal disorders to women is the correct application of medical management principles. Instructing supervisors and perhaps even employees to recognize early warning signs of MSDs and how to apply correct first aid can be invaluable in the management process. Developing appropriate modified or restricted duty jobs or tasks can speed recovery and decrease the likelihood of re-injury upon return to work. It is imperative that this modified duty be limited in time and vigorously supervised for optimum results.

#### Summary

Women have come a long way in the last 50 years in their struggle for equality in the work environment. To decrease the socially and financially debilitating issue of women in the workplace suffering a disproportionate number of ergonomics related injuries in the 21<sup>st</sup> century we must address the deficiencies of our programs on Ergonomics, Education and Exercise/Fitness.

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