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ERGONOMICS EVALUATIONS

We are confident that our medically based approach to ergonomics can benefit your organization by 1) reducing workers' compensation costs, 2) providing guidelines for cost effective equipment purchases, 3) reducing the incidence of musculoskeletal disorders in your work force, and 4) improving worker productivity and morale.

We typically offer 3 levels of ergonomics evaluations for office settings: the Diagnostic Evaluation, the Standard Evaluation, and the Mini Evaluation.

The Diagnostic Evaluation is recommended for employees with an open workers' compensation case or under a physician's care for a serious condition. This is a two hour evaluation in most cases. A report is provided that is suitable for medical or insurance files. The Anchorage fee is \$275 per evaluation. Outside Anchorage: \$325

The Standard Evaluation is performed in one hour or less, at the worksite, and is suitable for clients who have symptoms but are not yet under a physician's care for serious diagnosed conditions. The report is in a chart format with summary recommendations, and equipment specifications provided on additional pages (if desired). The Anchorage fee is \$150 per individual evaluation. A Group Rate of \$125 per person is offered for 6 or more evaluations scheduled together. Outside Anchorage: \$225 individual / \$175 group rate

Follow Up Evaluations are available as well, at a fee of one half the original evaluation. A one page report is included with the Follow Up Evaluation.

The Mini Evaluation, the last type of evaluation, is a short process of determining measurements for the employee's workstation, with a hand written one page report left on site at the end of the evaluation. This evaluation does not have the lengthy observation and training components included in the Diagnostic or Standard Evaluations. Normally, two or maybe three of these can be done per hour. These evaluations must be scheduled in multiples, and are not suitable for employees who are reporting significant symptoms. This gives you quick measurements for use when entire departments are moving to new office space, for example. The Anchorage fee is \$125 per hour. Outside Anchorage: \$175 per hour.

Contact Deborah Krebs: Email deb@situsergonomics.com Cell phone 907-227-4014



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TENSION REDUCTION STRETCHING ROUTINE

Deborah Krebs

Upper Back and Shoulders

1. Shoulder rolls backward
2. Clasp hands behind back, press shoulders back, gently raise arms
3. Clasp hands overhead, gently press arms back
4. Place hands behind ears, arms bent at elbow
 - Gently press elbows back, do not push against head
5. Shrug shoulders up and down with small, quick movements

Shoulders and Neck

1. Three Step Upper Trapezius Stretch:
 - Relax shoulders
 - Gently bring right ear to right shoulder and hold
 - Gently pull left arm down and hold 20-30 seconds
 - Gently turn chin towards right shoulder and hold
 - Very gradually relax arm and return head to neutral posture, first untwist neck, then raise headRepeat on left side

2. "V" Neck Stretch
 - Drop chin to center of chest
 - Slowly trace chin from center of chest to right shoulder
 - Hold position, as if trying to see floor behind you
 - Slowly trace a "V", taking chin back to center then up to left shoulder
 - Hold position as if trying to see floor behind youRepeat sequence

Wrists and Forearms

1. Place palms together close to chest
 - Gently lower forearms, stopping just before palms begin to separate
 - Hold for 30 seconds
2. With palms together as above, pull arms slightly away from body
 - Rotate palms gently to inside and outside, holding at ends of range of motion
3. Separate hands and roll wrists in circles in both directions
4. Extend right forearm with elbow straight, fingers hanging down
 - Gently pull on back of right hand, to create stretch in right forearm extensors
 - Repeat with left forearm
5. Shake out hands

CAUTION: NEVER TAKE ANY STRETCH TO THE POINT OF PAIN

Do not use this handout without first receiving professional instruction

Situs[®] Network

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Characteristics of an Ergonomic Workstation

Liz Dowler PhD, OTR/L, CRC

Employers are concerned with preventing on-the-job injuries and providing work environments that improve health and productivity. Office furniture often dictates positioning by forcing the worker to adapt to the furniture.

Most office furniture still in use today was designed during the age of the typewriter and no longer fits the work tasks of today. Technology moved forward, workstation furnishings need to do the same.

Body positioning impacts activity. We work most efficiently when in a neutral posture, since it's the way we were designed. Ergonomics is the science of fitting the task to the person. Each person is different, thus adjustable furniture is required to allow individual workers to work in a neutral posture. This can be achieved.

The first consideration is seating.

Features of ergonomic chairs; (1) Seat height and shape is determined by lower leg length. The taller the individual, the taller the chair. Feet need to be flat on the floor with the knees lower than the hips. Models with hydraulic lifts are common. The seat surface should be the correct size for the individual. It should have the forward edge turned down and be firm, flat or contoured to meet individual desires. A flat seat allows for easy movement in a chair during the day, and also assists in upright posture. The seat tilts forward or rocks back to accommodate different work tasks. Sitting in a forward tilted chair will assist in upright position of the spine and head. (2) Casters allow for easy movement

between work surfaces. They come in various types to match floor surfaces. (3) Arm Rests are generally preferred to give support to arms and assist with good sitting posture. They should be adjustable to meet individual needs and adjust to desk height. (4) Back Rest must have a well formed lumbar pad to support the lumbar spine, be height adjustable, have an adjustable inclination and lock at any desired position. (5) Adjustments should be easy to reach.

Good ergonomic chairs are the most costly part of the workstation. The chair is a tool just like the computer, if the employee is not positioned properly, productivity will suffer.

Next consider the desk. This is something that can be modified to meet current work requirements. Since there is a significant amount of paper handled in an office, both computer and desk work spaces are required. The proper desk height will minimize spinal curving, head forward and shoulder elevated posture. Headaches, neck and shoulder pain are often caused by desks being too high or too low. After the chair height is set, desk height is determined by measuring the elbow at 90°. Change the desk height, not the chair. Arms and shoulders should be relaxed when typing. Wrists need to be supported at the palm to provide neutral wrist position and a place to rest hands during typing. The use of a **Negative Sloping Keyboard Tray** will allow the worker to reduce the tension in the shoulder, neck and forearm muscles. The computer can be set up on either the return, the main desk, or in the corner. Utilize the corner for large monitors. Standard wood or metal desks can be raised with Desklators[®]. Shorter workers may need a flat footrest when the desk cannot be lowered. Some furniture is height adjustable and can be raised or lowered

to meet individual needs.

Documents are placed within the centerline between the monitor and keyboard to minimize neck rotation. A sturdy document holder can hold books and reference materials, and be used as a sloped writing surface.

Monitor height is determined by matching the top of the screen to the eyebrow when the head is erect. Safe distance from the screen is 22-24", farther if the monitor is larger than 15 inches. Raise monitors with VuRyzers[®], reams of paper or old phone books.

Workstation

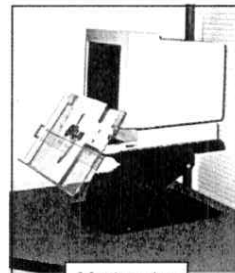
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Chair



Document Holder



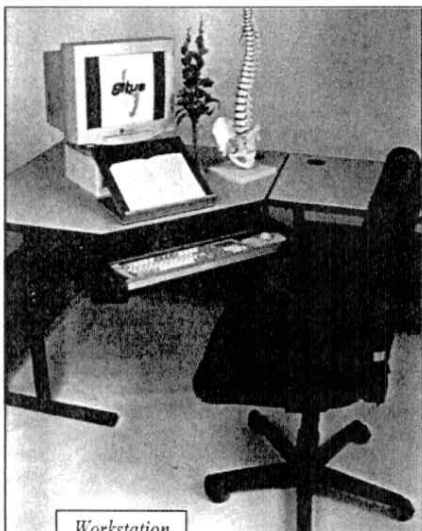
Monitor Arm



Palmrest



Tilt-Down Keyboard Tray



Workstation

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Research Data Review:

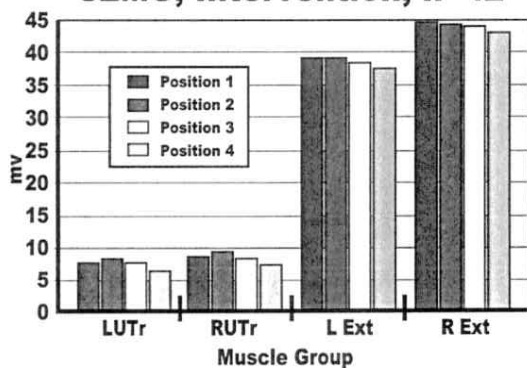
Liz Dowler PhD, OTR/L, CRC

A field research project was conducted by Liz Dowler to evaluate if adapting workstation environments to a worker's physical profile facilitates a reduction in Cumulative Trauma Disorders (CTD), improve Safety and increases efficiency in work performance.

Neutral posture as defined in this study (Position 4):

1. A forward sloping seatpan set at a worker specific height puts pelvis, spine and head in full upright position thus reducing stress on spinal structures and musculoskeletal systems. (Mandal, Schoberth, Bridger, Bendix)
2. Height of desk, keyboard and monitor is based on individual seated height in a forward sloping seatpan.
3. The monitor, document and keyboard are in alignment in front of operator.
4. Keyboard placed at 15° negative slope and elbows at 115° and wrists in mid-range.

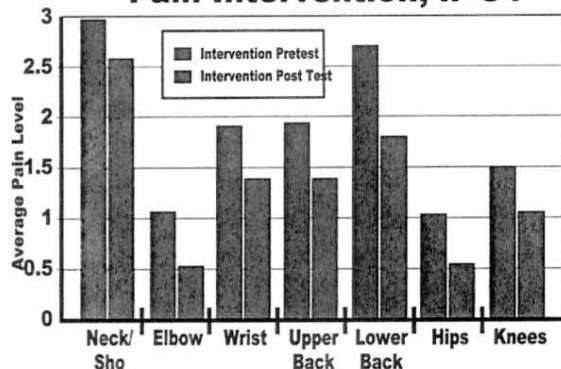
sEMG, Intervention, n=42



Subjects:

Eighty-seven (87) workers at Alyeska Pipeline Services Co., the University of Alaska, Anchorage, and the Anchorage School District participated in the study.

Pain Intervention, n=84



Methods:

Surface electromyography (sEMG) measures the work done by muscles in terms of micro volts (mv) of activity. Upper trapezius and forearm extensors were measured during four, 5 minute typing tests while subjects worked at four different workstation arrangements. These positions include: (Position 1) subject's working position as they were found (Position 2) workstations using the American National Standard Institute (ANSI HFS 100-1988) as a guideline (Position 3) positioned height specific, seatpan tilted forward at the pelvis, keyboard on desk with 90 degrees at the elbows and wrists in mid-range (Position 4) neutral posture, as defined above. Subjects were placed in one of four groups and then tested again 30 days later. Pain was recorded by each participant during a pre-screening and at the conclusion of the study.

Results:

- Results reveal muscle tension during typing activity reduced significantly ($p < .001$) when using the Negative Sloping Keyboard Tray (Position 4).
- There were no differences between pre-test and post-test scores in either control or intervention groups indicating that the muscles used when doing VDT work responded immediately to changes in positioning.
- The intervention group who used the neutral posture workstation (Position 4) significantly reduced ($p < .001$) pain levels.
- Productivity was measured by word count per minute during typing tasks. The data reveals no decrease in productivity or efficiency when in neutral position.

Conclusion:

VDT workers responded immediately to neutral posture using forward tilted seating, midline positioned monitor and document, and the Negative Sloped Keyboard Tray. This was demonstrated by reduced muscle use and reduced pain symptoms. These results may produce potential cost saving by influencing long term benefits to employee health without decreasing performance and efficiency.

Workstation (Continued)

The most tension-reducing position is one in which the body, head, keyboard and the source document are in center alignment.

Stretching exercises during the day interrupt static and repetitive positions.

Training classes to learn proper exercises, positioning and safe work practices are provided as part of the ergonomic process to prevent injury, promote health and enhance productivity. It may be the most important benefit you have ever provided your workers and the most profitable investment you have ever made in your business.



Sitting in the Neutral Position on a Bicycle?

Bob has worked with Situs for 10 years as an inventive and skilled craftsman, building products to make tasks easier for people with disabilities. He loves to ride his bicycle, but has a spinal condition that prevents him from bending over.



His solution was to weld an additional set of handlebars onto his bike frame and add a pneumatic cylinder to make the seat height adjustable. This allows him to change the

seat height easily and sit up straight while riding. Aerodynamically correct, maybe not, but he didn't have to give up a sport he enjoys.

Office ergonomics is a specialty in itself. As professionals we know it is impossible to be a specialist in everything. As a member of the our networking system you will be provided with the newest information in Office Ergonomics. We'll share information, evaluate products, and pass on new ideas.

Editors: Liz Dowler, Greg Pemberton
Graphics: The Graphics Department

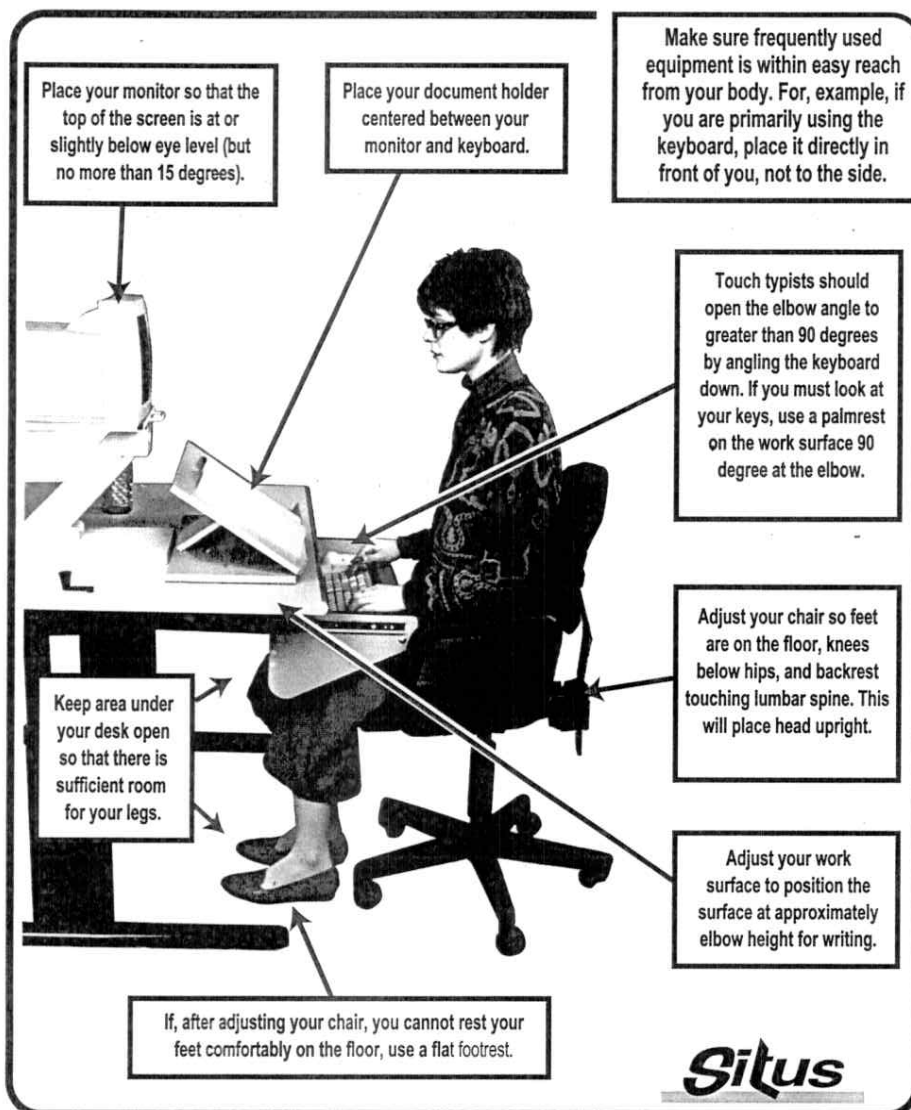
Situs

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Situs

Frequently Asked Questions FAQ's

Where do I put my document to reduce the pain in my neck?

Liz Dowler PhD, OTR/L, CRC.

Normal visual angle is a range from 15° to 22° in the sagittal plane. There is less necessity for the head to flex forward as the eyes will shift downward comfortably. In the horizontal plane, the eyes should focus towards the center. It is uncomfortable to focus to the side without turning the head. Tension in the muscles in the back of the neck is the factor most significantly affected by document position during both reading and typing tasks. Neck flexion (forward tilting) is a critical factor in the production of tension in the back of neck. The levels of tension found are high enough to produce some discomfort over a period of 8-10 minutes.

Head position while typing is determined by the location of the primary visual task. For data entry operators the primary visual task is 70% on the source document and 18% on the monitor. With operators who interact with documents, but do not use them to copy, the primary visual focus is 30% on the monitor, and 28% on the document. There are significantly higher levels of tension in the muscles in the back of the neck and at C7, (the bone we feel at the base of the neck), the farther away the document placement is from the center. In workstation design the most tension-reducing position is one in which the body, head, keyboard and the source document are in center alignment.

References:

- Villanueva, Sotoyama, 1996,
- McCormick and Sanders 1982,
- Maeda, 1977, Cakir et al. 1981,
- McCormick and Sanders 1982, Laville 1980,
- Grandjean et al 1984, Jaschinski-Kruza 1990,
- Noro, 1992, Hamilton 1996.

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Diagnostic Workstation Assessment

The purpose of a Diagnostic Workstation Assessment is to determine the risk factors causing symptoms experienced by the worker, and make recommendations for decreasing or eliminating the risk factors. This process includes interviews, anthropometric measurements, workstation measurements, space planning, and education. A follow-up is done to assess the success of the modifications and education, and to make any further recommendations required.

Risk factors common to the office workplace:

- Working overtime
- Equipment too far away from user
- Not taking sufficient breaks
- Heavy mouse use
- Extreme postures
- Extended repetitions
- Static loading

Common problems in the office workstation:

- Chair does not fit the individual or move with the user
- User does not know how to use the chair properly
- Worksurfaces are too high or too low
- There are no palm supports for arms and hands during extended repetitions
- Monitors and keyboards are too high or too low
- Worker works without taking adequate breaks



Who is Situs? Corporate Backgrounder

WHAT DOES IT MEAN?

The word "Situs" is Latin for "Natural Position". It defines the company's philosophy of training employees and providing the workstations that put workers in good position so they may work safely and productively.

PHILOSOPHY:

Situs specializes in creating healthy and safe workplace environments by reducing the incidence of Cumulative Trauma Disorders (CTDs) and other repetitive motion injuries. These account for 61 percent of all workplace illnesses, according to the Center for Information on Cumulative Trauma Disorders. CTDs include tendonitis, tenosynovitis, tarsal tunnel and carpal tunnel syndrome. These often stem from poor posture and/or repetitive twisting, turning, lifting or other motions by certain parts of the body.

Situs is just the opposite of the typical market-driven company. Instead of building a product and creating a need for that product, Situs identified the need first, then discovered the solution. Situs is a company founded on research and proven ergonomic theory. The company's principals spent more than a decade in the fields of occupational therapy and rehabilitation researching, analyzing and testing the relationship of body position and posture of individuals who experienced injuries severe enough to keep them from working in the standard working world. It was from this research that Situs' philosophy of natural positioning and the company itself were born.

Situs refers to itself as a "new company with old ideas" because it takes a basic educational and preventative approach to workplace injuries. The company adopts the view that Cumulative Trauma Disorders are 100% preventable, but it acknowledges that both employers and employees must take responsibility - employers by providing a safe environment and employees by educating themselves and practicing proper body mechanics.

Situs does not advocate buying a new truckload of office furniture to achieve natural positioning. Although the company offers a full line of ergonomically engineered furnishings and accessories for the work environment, it focuses on providing simple and long-lasting solutions based on the principals of ergonomic science.

The Situs Prescription for a healthy work environment is an integrated educational approach.

Situs educates employees so they can use the knowledge of natural positioning effectively for a lifetime of productivity at work and at home. In most cases, modification of existing office equipment is all that is required. A simple adjustment of hand, torso, and head position can prevent an injury and reduce discomfort.

KEY PRINCIPALS:

Situs was incorporated in Alaska in December, 1992 and expanded to Portland in April, 1993. The company was founded by Liz Dowler and Greg Pemberton.

Liz Dowler holds a Ph.D. in Ergonomics, is a registered occupational therapist and a certified rehabilitation counselor who has spent more than a decade working with major corporations in the areas of training work efficiency, safety, and injury prevention. She is a frequent speaker and published author on ergonomic issues.

Dowler has spent more than two decades in the field, helping people with severe back, neck, and arm pain that made it difficult - and sometimes impossible to work. She has met some of the leading ergonomics specialists worldwide, conducted extensive research, and published papers that show a clear link between posture, seating position, and workplace injuries known as cumulative trauma disorders.

Greg Pemberton has experience in the engineering and construction fields and has done extensive research on the ergonomic theories and practices in use today. His focus for the past six years has been on workstation evaluation and modification using modern ergonomic theory. His design for a negative-sloped keyboard tray has been patented (U.S. Patent No. 5,273,250).

PRODUCTS AND SERVICES:

Situs provides a full range of training and consulting services designed to reduce repetitive motion injuries. These services include management training/consultation, employee training classes, workstation assessments, ergonomic job analysis, and classes designed to train employees to be designated ergonomic specialists within a company, often referred to as "Train the Evaluator" programs.

Situs also markets a wide range of ergonomic office furniture, including adjustable height chairs, tables, and workstations. Accessories such as com-

puter monitor arms, computer palmrests, slant-boards, and footrests are recommended on an individual basis.

Situs manufactures a negative sloped keyboard tray that is patented and has designed ten types of chairs that are manufactured in Oregon. Situs also distributes the Bambach Saddle Seat, a unique office chair invented in Australia that achieves a natural spinal curve and reduces pressure on the lower back by placing body weight on the hip and pelvis.

Situs Consulting Services is based in Anchorage, Alaska and maintains an office in Portland, Oregon. Situs' independent product representative for the Central U.S. is Situs Office Ergonomic in Denver, CO. For the Portland, OR and Vancouver, WA area the product representative is Harris Work-Systems. Associated companies are in Seattle, WA, and New York, NY.

WHAT PEOPLE ARE SAYING:

Adjustments work. "I wanted to let you know how well the adjustments to my office area are working for me. The change is just remarkable! The negative slope keyboard is probably the single most important improvement that was made for me. Within a week or so the tendonitis was abating in my arms - I could hardly believe it.... Other things that made a great difference are the electric stapler, foam pen grips, spring scissors, and the glare/guard. However, one of the best things was the knowledge that you both appeared to really 'care' that these things got done and that I was comfortable, and for that I thank you most of all."
- Villi Valentine, Portland Community College

Dramatic recovery. "I have very low blood pressure and have had a continuing problem with carpal tunnel syndrome, which has greatly increased in the last five months.... Since I got the (keyboard) drawer, the persistent pain has gone completely away (though I feel a little if I test for it). Also I don't have a tension knot on my neck or a burning sensation on my back.... This is a dramatic recovery in my book.... I believe the keyboard drawer to be a major contributor to my recovery; and I highly recommend it for use by others with CTS problems."
- Pam Moore, City of Portland.

THE CONCLUSION:

Cumulative trauma disorders are virtually 100% preventable if proper body positioning is practiced. The problem is that most office equipment does not encourage proper positioning and most workers don't know what proper positioning is. Situs fills this void by taking a pro-active approach to injury prevention through employee education, workplace evaluation, and workstation modification.