Home Office Solutions
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Working from home is becoming more of an option for employees today. The type of work usually entails working from the home computer work station. Although most home computer work stations are designed with the décor of the home in mind, they may not be functional for long periods of work. Some studies as described in the Occupational Safety and Health Administration's "Working Safely with Video Display Terminals" have suggested that long periods of typing, improper workstation setup, incorrect work habits, stressful work conditions and relationships, or problems in your personal health may be linked to injuries. These injuries could include carpal tunnel syndrome, tenosynovitis, and other musculoskeletal disorders. The warning signs of these disorders can occur in the hands, wrists, arms, shoulders, neck, or back, and can include:

- Numbness, burning, or tingling
- Soreness, aching, or tenderness
- Pain, throbbing, or swelling
- Tightness or stiffness
- Weakness or coldness

Symptoms may be felt during typing, while using a mouse, or at other times when no work with the hands is being performed, including during the night when these symptoms can awaken a person. There are some low cost solutions for a proper home office setup. It's just a matter of a few important choices. Whenever a person uses a computer, they must make choices that can affect their comfort and potentially their safety. This is true whether a full size keyboard and monitor on a desk, a notebook computer, or a wireless keyboard is used. In every case a person must choose their working posture and body's position relative to the keyboard, pointing device, monitor, remote control, phone, and any reference books and papers. Control over lighting must also be taken into consideration.

Compaq's "Safety and Comfort Guide", outlines a few key principles for promoting a safe and comfortable work environment; Adjust, Move, Relax, Listen and Remember. Adjust body position and work equipment. There is no one "right" position. Move as to vary tasks so that sitting in one posture all day is avoided. Also, perform tasks that require walking. Relax and build positive

relationships at work and home. Strive to reduce sources of stress. Stay aware of physical tension such as clenching muscles and shrugging of shoulders. Continually release tension. Listen to the body's signals. Pay attention to any tension, discomfort, or pain that is felt and take immediate action to relieve it. And the last key principle is to remember to exercise regularly and maintain general fitness.

Rather than working in a single posture, find an "ergonomic" comfort zone. A comfort zone is a range of positions that is generally appropriate and comfortable for the given work situation. Depending on the task, a range of seated and standing postures may be used to vary the body's position throughout the day. Also, sitting for long periods can cause discomfort and muscle fatigue. Changing postures is good for many parts of the body, including the spine, joints, muscles, and circulatory system. Certain postures may be hard on the body, such as slouching forward, sitting in a fixed position all day, or leaning back too far. A comfort zone must be just that, comfortable to maintain.

Sitting and standing are not the only factors to take into account when the proper ergonomic comfort zones are taken into consideration, positions for the legs, back, arms, and eyes are equally as important. Feet must rest solidly and comfortably on the floor or placed on a footrest to allow for maximum comfort. Also, ensure that there is enough leg room for knees and legs. By avoiding concentrated pressure points along the underside of the thigh near the knee and the back side of the lower leg will help reduce cramping and fatigue. It is important to use the chair to fully support the body by distributing the weight evenly and using the entire seat and backrest for support. Also, it is important to keep the forearms, wrists, and hands aligned in a straight, neutral position, whether a person is working at a desk or table, or sitting on the couch or bed. Another factor a person must avoid is bending or angling the wrists while typing or using a pointing device. Always ensure proper adjustment of the chair height or keyboard height so that shoulders are relaxed and elbows hang comfortably at the sides of the body. Position elbows in a zone that is near the height of the keyboard's home row (the row that includes the letters G and H). This position allows the shoulders to relax.

Working at the computer for long periods can be a visually demanding task and may cause eyes to become irritated and fatigued. Eyes must have frequent breaks by periodically looking away from the monitor and focusing at a distant point. Also, the cleanliness of reading glasses or contact lenses and computer screen are other factors to take into consideration when trying to reduce eye strain. Even though there seems to be numerous factors to take into consideration when approaching a home work environment solution in an ergonomic manner, it is always important to just listen to the body's signals of fatigue. Pain is the body's reminder to adjust positions and move.

Take breaks often. When working at a computer for long periods, short breaks should be taken at least once per hour and preferably more often. Using timers or specialized software are good tools to use for remembering to take a break. During the break, standing and stretching, especially any muscles and joints that may have been held in an extended static posture will need to be stretched.

Arranging the work area allows the equipment to adjust to the body's comfort zone and not vice versa. The proper positioning and adjustment angle of the monitor will help to reduce eye strain and muscle fatigue in the neck, shoulders, and upper back. The monitor should be placed directly in front of the person. To determine a comfortable viewing distance, the Compaq's Safety and Comfort Guide suggests, "stretch your arm toward the monitor and notice the location of your knuckles. Place your monitor near that location." What the safety guide did not suggest, but should also be considered is to adjust the font size on the viewing screen to maximize eye comfort. The monitor position should also allow for the head to be balanced comfortably over the shoulders. It should not cause the neck to bend forward uncomfortably or backward to any degree. Tilt the monitor so that it faces the eyes. In general the monitor screen and the face should be parallel to each other. A good tip to check for correct monitor tilt is to have someone hold a small mirror in the center of the viewing area. When sitting in a normal work posture, the person should be able to see his eyes in the mirror. Also, take the time to eliminate glare and reflections. To control daylight, use blinds, shades, or drapes, or try other glare reducing measures. Use indirect or reduced lighting to avoid bright spots on the display screen.

Arrangement of the keyboard and mouse or other input devices should be positioned so that the body functions in a relaxed and comfortable position. In order to avoid having to reach or shrug the shoulders, the keyboard should be positioned directly in front of the person in order to avoid twisting of the neck or torso. This should make it possible to type with the shoulders relaxed and upper arms hanging freely at the sides of the body. When using a mouse or detached trackball, position the device immediately to the right or left of the keyboard. The body should not lean forward or the person should not have to reach when working with the mouse.

Arm supports and palm rests are more tools that a person should consider when designing an ergonomically correct home environment. Some chairs and desks provide padded areas for resting the arms. Proper alignment of the arm rest allow for the shoulders to remain relaxed and keep wrists free to move while typing.

Work surfaces should be large enough to hold the computer equipment and any additional items required for the work. To help minimize eye fatigue, the Compaq Safety Guide suggests to "position any materials to which you frequently refer about the same viewing distance." Also, arrange frequently used papers, books, or other items to minimize the distance a person has to reach for them. If the

person frequently refers to books, or other materials, and if they use a keyboard tray, it is important to make sure the tray, when extended, doesn't cause the person to lean or reach excessively. This will cause stress to the shoulders and back. Using a document holder can help better organize the work space. If a document holder is used, it is important to position it near the monitor at the same distance, height, and angle as the monitor. Positioning the holder in this way can increase the neck comfort as the person refers back and forth between working papers and the display screen, by helping to keep the head balanced over the shoulders. If the primary task is typing from paper documents, it may be more comfortable to place the document holder directly in front of the person and the monitor slightly to one side, or on a slant board between the monitor and keyboard.

Proper phone position is another factor to consider for maintaining proper body posture. Cradling the phone between the ear and shoulder may lead to neck, shoulder, and back discomfort. If the phone is frequently used, a headset or positioning the phone so it is picked up with the non-dominant hand may be a good solution. By picking up the phone with the non-dominant hand, it frees up the dominant hand for note taking. When the phone is not in use, it should be placed within easy reach to prevent repetitive strain.

Tasks should be varied to help reduce stress or strain. Work habits should be examined and the types of tasks performed. The routine should be broken up and varied to help reduce sitting in one position or performing the same activities continuously that use repetitive movements in the hands, arms, shoulders or that cause neck or back strain. Printing out data to proof read could be one solution to having to sit in front of a monitor all day or using voice recognition software may be another alternative.

When considering ergonomic factors for the home office, being creative can save a lot of money and provide the comfort needed to prevent stress and strain. Pillows, blankets, towels and books can be used to raise the height of a seat, create a footrest or support a sore back. Therefore, expensive chairs or office furniture don't always guarantee that it is of good quality or ergonomically correct. Finding a comfortable chair with a lower back support that properly fits the individual's body is more important than looks or cost. Even while working while on the road, a simple and inexpensive solution to ease discomfort from a poorly designed chair is to place a rolled towel to support the lower back and a blanket as extra padding. Although most chairs and office furniture are probably built to fit the 95th percentile of the population, one must never assume that it will fit. Ordering home office workstations or furniture from a catalog can be a costly mistake. It is better to ensure a proper fit and function by "trying on" the furniture before a costly investment is made. But most importantly of all, just proper adjustment, arranging the work area, plenty of breaks, and keeping the body moving is an inexpensive way to ensure an ergonomically correct home work office.

References

Compaq Computer Corporation "Safety and Comfort Guide"; First Edition (September 1997) Part Number 297660-001

U.S. Department of Labor Occupational Safety and Health Administration OSHA 3092 1997 (Revised); http://www.osha.gov/Publications/osha3092.pdf