

# "Conventional Wisdom" VS. Current Ergonomics

*International Human Factors* summarizes some of the new research in office ergonomics.

Most of us have some misinformation about office setup and posture. Much of the misinformation is quite old, but it persists because:

- 1) we've heard it all our lives,
- 2) everybody we know seems to think the same thing,
- 3) it sort of makes mechanical sense (but not biological sense!),
- 4) we actually heard or saw it RECENTLY, perhaps in a sales presentation for some kind of ergo gizmo.

Unfortunately, not all writers, trainers, product designers, or even physicians can keep up with all the scientific developments.

Here are examples of conventional ergonomic wisdom that are being challenged. Most of them involve, happily, a RELAXING of old strict rule.

- Current ergonomics encourages variety and movement rather than an exact posture.
- Conventional wisdom for **monitor distance** is that it should be 18-24 inches away. This is wrong. The best distance is "as far away as possible while still being able to read it clearly." Longer distances relax the eyes. The "conventional" 18-24 inch recommendation is unnecessarily close.
- Conventional wisdom for **keyboard distance** is that it should be approximately at the front of the work surface. This conventional wisdom is limiting. There's nothing wrong with pushing the keyboard back farther if the forearms are supported (or on top of the worksurface when the individual's worksurface is at an adequate height), provided the wrist is kept straight and the elbows aren't resting on anything hard or sharp. Usually, to make a pushed-back keyboard work, the worksurface should be higher than elbow height. (see height, below)
- Conventional practice for **placement of the mouse** is to push it away. Closer is usually better, next to the keyboard is the goal. Within the anthropometry or directly in front on the arm perpendicular to the torso is best. The best mouse is no mouse. Learning all functions keys on your keyboard allows reduction of mouse use and along with mini keyboards or integrated mouse keyboards, neutral posture is reached most often and more naturally for any users.



- Conventional wisdom regarding a **chair** is that the chair should be at a height that allows the feet to reach the floor when the legs are in the "conventional wisdom" position of **90 degrees (at the knee)**. The ninety-degree knee posture is not "correct" ergonomics although it is not a harmful position. The legs should move very often, not stay fixed in the ninety degree position. The chair should, if possible, be low --- low enough for the feet to rest on the floor, even when extended. However, if the chair is at a good height but the keyboard height can't be adjusted to elbow height or lower, then it's necessary to adjust the chair upwards. In this case, a footrest is an option.
- Conventional wisdom says **footrests** are always a fine alternative and that chairs and worksurfaces don't need to be lowered if a footrest is available. The truth is that footrests are a distinctly second-class choice because the feet only have one place to be, and leg postures are limited. However, if the chair is already low enough, footrests offer a chance to change leg postures and are recommended. Using a mobile footrest or platform is recommended and allows the user to freely move his or her legs while resting securely on a flat surface.
- Conventional wisdom prescribes an **upright posture, with the hips at ninety degrees**. However, a great deal of research supports the idea of a much wider hip angle --- with one hundred thirty degrees or so as an "optimum" angle. The reason? When the hips are straightened, the vertebrae of the lower spine (lumbar at sacrum area) are aligned with each other in a way that reduces and evens out pressure on the intervertebral discs. Further, sitting upright is less desirable than reclining. When reclining, the lower back muscles work less and the spine supports less weight, since body weight is held up by the chair's backrest.
- Conventional wisdom for **keyboard height** is that it should be at elbow height. This is wrong, or at least too narrow. Variation from elbow height is fine, especially in the lower-than-elbow direction.
- Conventional wisdom for **keyboard angle** is that it should be flat, or up on its little support legs. This is wrong. The keyboard angle depends entirely on the forearm angle, and should be in the same plane as the forearm. So, a low keyboard should be slanted back. Some people expect they won't be able to see the keys if the keyboard is sloped back, but this is usually not a problem.
- Conventional wisdom is that the **wrists should be kept straight**. In this case, conventional wisdom is correct, as far as we now know, however individuals must keep in mind that wrist pain or discomfort is not always associated with tendonitis or CTD (Cumulative Trauma Disorders). It is to be noted that 30% of all tendonitis or CTD symptoms are often caused by anemia or iron level deficiency or stress related. Furthermore, 80% of hand and wrists operations completed in the last 5 years had recurring problems. Therefore, perhaps inflammation of the carpal tunnel was not cause by the mouse or the physical environment.



- Conventional wisdom for **monitor height** is that the top of the screen should be about at eye height. This is fine for some people, wrong for many. The current recommendation is that eye height is the highest a monitor should be, not the best height. Many people find a low monitor to be more comfortable for the eyes and neck. When an individual reads, he or she reads downward (like a book). Your monitor is also a source of reading material. Of course adjustment must be made for bifocals users and specificity.
- Conventional practice puts the monitor on top of the CPU --- the best solution in most cases is to put the monitor on the work surface, because of the monitor height issue. CPU should be off the worksurface but nowhere where it can obstruct space allocation. 3M style in-line document holders should only be provided without the storage drawer, not to unnecessarily increase monitor height.
- Conventional wisdom for **wrist rests** is that they can do no wrong and should always be used. This is wrong. They may be able to cause harm if they're too thick, too thin, too hard, or have sharp edges (even sharp edges of foam). They also can cause harm, if they're constantly used directly at the wrists area. A wrist rest should not be called wrist rest but palm rest. The carpal tunnel is under the wrist/palm and should not be subjected to much extra pressure.
- Wrist or palm rest at the mouse should not be used unless specified otherwise by ergonomist. Conventional practice is to supply wrist rests for the keyboard but not the mouse and it is correct. With mouse movement and constant wrist deviation, mouse rest provides too much pressure to the wrist area and carpal tunnel.
- Conventional wisdom for "ergonomic" **keyboards** is that they're good for everybody. In actuality, some are good and some are bad. Some are right for some people and not for others. The only kind of ergonomic keyboard that we and many other ergonomists can recommend in good conscience is one that can be configured to look exactly like a normal keyboard. A standard KWERTY keyboard is still recommended unless individual anthropometry or specificity requires otherwise.
- Conventional practice recommends **rest breaks** about fifteen minutes long, every two hours or so. This is insufficient for single-task work such as typing. Research supports the idea of very short breaks done very frequently. We call this micro-breaks. For example, 30-second breaks every ten minutes or so. These should happen in addition to the normal fifteen-minute coffee breaks.



Finally, conventional wisdom holds that there is such a thing as a "**correct**" posture. In reality, posture change seems to be as important as posture correctness, especially with regard to the intervertebral discs in the spine. These discs lose fluid over the course of the day because of the weight they carry. Posture change is essential to help pump fluid back into the discs. People who stand all day tend to have back problems; but so do people who sit still all day.

This short paper has described a number of ways in which conventional ergonomic practice and wisdom are contradicted by recent research. It is possible that future research will show that some of today's "progressive" practices are incorrect. In addition, "progressive" ergonomics will invariably be incorrect for some individuals. The ultimate standard is individual comfort (especially over time), tempered by individual preference, control, and choices.

Of course choosing an ergonomist you can trust will be your first line of support.

For more information, contact IHFC at 1-877-IHFCergo (1-877-443-2374)  
Stéphane Trottier, M.Erg.S., I.C.I.A., I.P.F.M., HE, O.I.E.,  
Ergonomist

