

Height Adjustable Workstations Allowing for Alternating Between Sitting and Standing

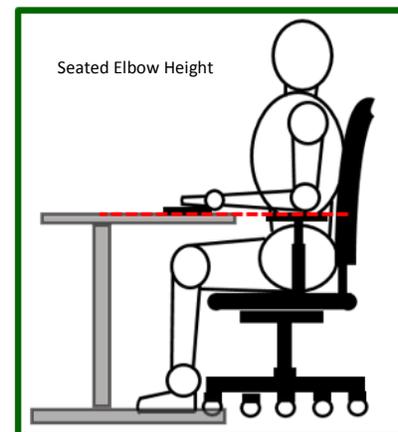
Although the ability to stand can be beneficial, making modifications to the workstation to allow for alternating between sitting and standing should not introduce ergonomic hazards into the workstation. This unfortunately can be a common problem given the highly available and relatively inexpensive 'platforms' which are attached to or sit on top of an existing table or work surface.



Although these 'platforms' may be height adjustable, there are significant detriments introduced into the workstation which can expose the user to ergonomic hazards and increase the risk for injury. One of the main issues with platforms that are placed on a fixed work surface are that these platforms do not adjust appropriately below a standard work surface height. This is crucial for upwards of 95% of the population.

The standard work surface height, which was designed for the 95th-98th percentile male (~6'2 – 6'4) is approximately 29-31 inches high. Much like the design of doorways, this work surface height allows for a majority of the population to fit underneath the surface without encountering leg obstructions (knees/thighs bumping the work surface). Although this height allows for most users to fit underneath the surface, it does not allow for an ideal working elbow height for upwards of 95% of workers.

To further illustrate, think of the work surface height related to shoe size. Much like a shoe should fit the foot, the work surface, desk or table should 'fit' the body. In order for a work surface height to properly 'fit' the body, the work surface height (keyboard and mouse height) should be located at or slightly below resting elbow height (see picture at right). When the work is designed to be performed at elbow height, the risk shoulder, neck and back fatigue and strain due to awkward postures is minimized.



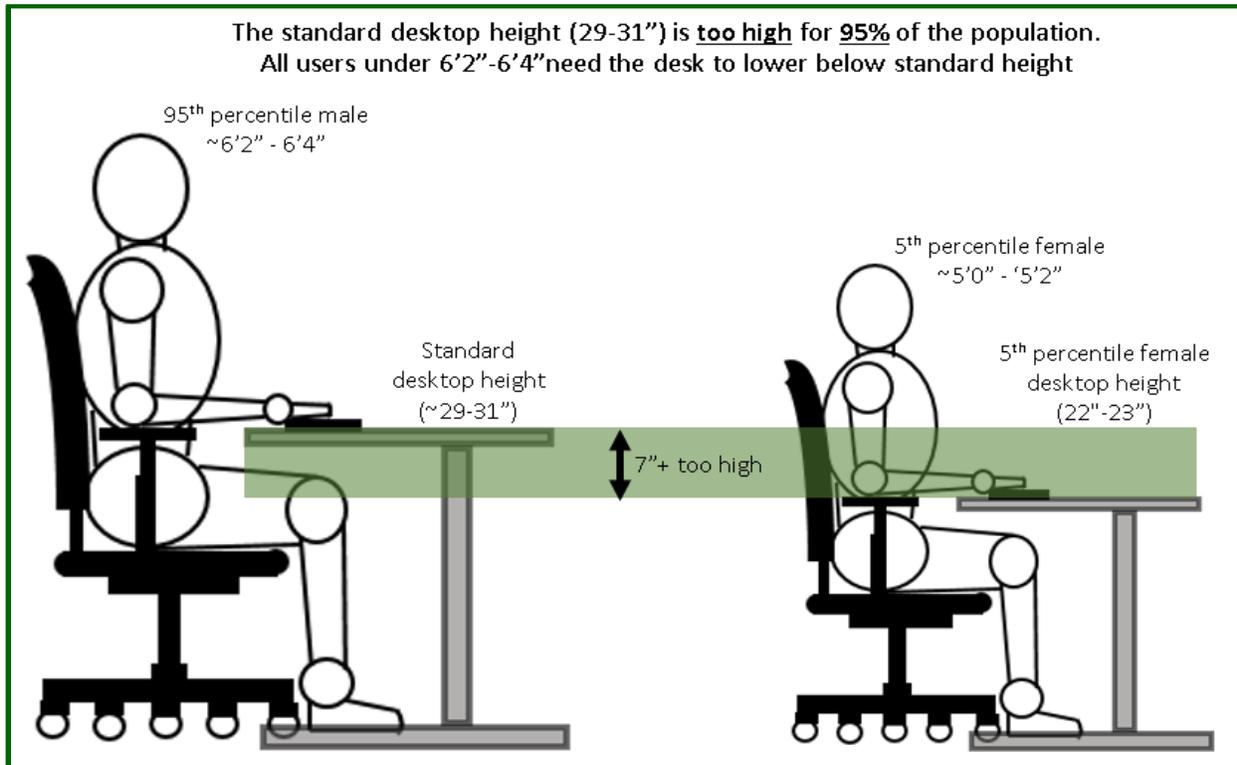
Regardless of the height adjustable option used, if the work surface does not adjust correctly, (below the standard 29-31 inch work surface), it will force the work too high. This will be the case for anyone shorter than approximately 6'2" tall (or 95% of the working population).

If a height adjustable 'platform' is added to a standard 29-31 inch work surface and the platform does not allow for adjustment below work surface height, the keyboard and mouse are raised even higher (32-35 inches) which immediately creates ergonomic hazards when a user sits.

To further illustrate using the same reference to shoe size, if workers have work surface height of over 29 inches is like having majority of the working population wear a 12-14 size shoe (or bigger) and expecting it to 'fit'. Because 'platforms' the Varidesk force the work surface another few inches higher (height of the keyboard and mouse higher), the user now is being asked to wear a 14-16 size shoe. Height adjustable options need to lower below 29 inches for ~95% of workers, not higher. Platforms that sit on top of a standard fixed work surface height simply will not 'fit'. If used, risk for injury and exposure to ergonomic hazards increases.

Desktop Height Illustration

The below picture illustrates the work surface height difference for a 95th percentile male compared to a 5th percentile female. An average 5'8" male (not shown) needs their work surface height at approximately 26-27 inches. Even for this average height male, a standard desktop is approximately 4 inches too high. Although this is not the 7 inch difference shorter females may encounter, the fact remains that the surface is too high. Again, back to the shoe reference, it is like wearing a size 10-11 shoe when a size 7-8 is needed. Improper fit.



The Computer Hunch

Because the standard 29-31 inch work surface forces the keyboard and mouse too high, very common awkward postures are assumed in the neck, shoulders, elbows and upper back. As illustrated in the picture at right, leaning forward and 'hunching' over the work surface increases the lumbar disc pressure by 85% in comparison to standing in a relaxed posture (Wilke, H., Neef, P., Caimi, M., et al., 1993). Along with the computer hunch, the shoulders often round forward, elevate and or abduct (swing out to the side). These postures create tension and fatigue on the shoulders and upper back which can lead to discomfort and injury over time.



Picture Source: Humanscale Ergonomics

Sitting at a computer and hunching over the desktop increases back pressure by 85% compared to standing upright

Standing Height

Work surface height is not only important when sitting. If the work surface does not adjust sufficiently when standing, similar ergonomic hazards can be introduced and can be equally damaging to the body. The increase in ergonomic risk and exposure to ergonomic hazards are commonly seen with taller individuals because the work surface does not rise adequately. Certain 'platforms' may not adjust high enough to 'fit' taller users. Ergonomic injury risk factors are common if the work surface is too low. These factors include extension of the elbow and wrist, rounding of the shoulders, and back flexion (leaning forward at the waist). Using the shoe example once again, if the work surface, keyboard and mouse do not rise appropriately, the taller user is being asked to wear a size 8-9 shoe when a size 12-14 is needed. Again, improper fit.

Due to these and other several other factors, 'platforms' such as the Varidesk are not recommended as they are not ergonomic options, do not fit 90-95% of the working population and expose the user to ergonomic hazards and increase the risk for injury.

An electric height adjustable table which meets ergonomic design criteria should be implemented as there are no limitations, perhaps other than the initial cost for investment. An electric height adjustable table that adjust from ~22-50 inches ensures that the work surface has the capability to adjust to properly fit a majority of the population's varying size and stature. A table which meets ergonomic design criteria will properly 'fit' employees regardless of their, height, weight, gender, etc. Responsibility then belongs to the user to ensure proper adjustments are made to the workstation and work surface height in order to reduce the exposure to ergonomic hazards, minimize injury risks and decrease the likelihood for injury.

For additional information on office ergonomic design criteria and specifications, go to the below website. <http://rmi.prep.colostate.edu/ergonomics/officecomputer-ergonomics/furniture-specifications/>

Please contact the ergonomics administrator with additional questions.

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