

Healthy posture of the upper body when reading and writing is dependent upon the location and angulation of the surface that we are reading and/or writing on.

Reading, Writing & Posture

IT IS COMMON TO HEAR PEOPLE LAMENT THE DELETERIOUS EFFECTS THAT DESKTOP COMPUTERS HAVE ON OUR POSTURE.

However, when we look at the various ways in which we can read and write, this judgment may not be accurate. Before the advent of desktop computers, typical postures for reading and writing were often far from ideal. And the postures assumed when using laptops, cell/mobile phones and tablets are usually just as bad.

Although the actual effect upon our posture is primarily determined by how carefully we position our

body for each one, an argument can be made that desktop computers actually allow for the healthiest posture of our upper body when reading and writing.

HEALTHY POSTURE OF THE UPPER BODY

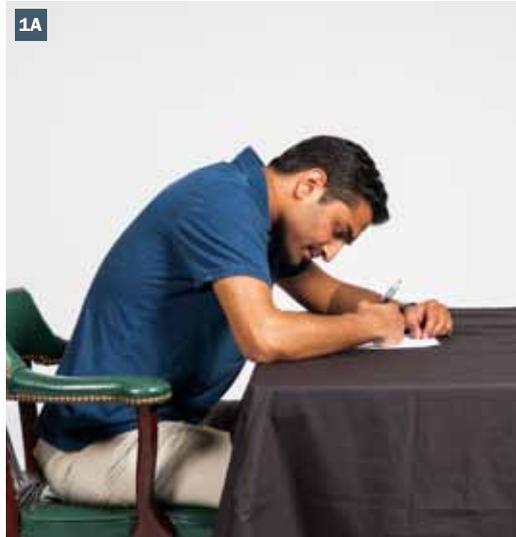
Healthy posture of the upper body when reading and writing is dependent upon the location and angulation of the surface that we are reading and/or writing on. If the surface

is down in front of us, there is a tendency to bend and hunch down toward it. If the surface that we are writing on is too high, there is a tendency to elevate our shoulder girdles to reach it. When reading, it is optimal to place the book/screen at eye level and orient it vertically so that it faces us. When writing, it is optimal to work at the level that allows for our (upper) arms to be vertical and relaxed, and our forearms to be flexed at the elbow joints approximately ninety degrees. And, when possible, it is beneficial to support the weight of the upper extremities by resting our forearms on armrests.

Pen and Paper.

Before computers became omnipresent, writing was usually done with a pen and a piece of paper. Because the paper is placed down in front of us on a horizontal surface, there is a tendency to round forward and slump the upper back and neck (**Figure 1A**). Habituation of this posture promotes a rounding (hyperkyphosis) of the thoracic spine and a straightening (hypolordosis) of the cervical spine. It also places the head in an imbalanced posture, with its center of weight over thin air. This would cause the head to fall into flexion until the chin hits the chest were it not for the isometric contraction of the posterior extensor musculature of the cervical and upper thoracic spine. Prolonged isometric contraction overuses and fatigues the musculature, often leading to pain and the formation of myofascial trigger points. Of further concern, prolonged isometric contraction increases compression through the spinal joints that are crossed by the musculature.

For this reason, before computers became popular, engineers and architects used drafting tables that were angled upward to allow for a more upright posture. An alternative to a drafting table that is available today is a portable “writing desk” that angles the paper up toward the writer, allowing for a more upright posture (**Figure 1B**). Without the use of a writing desk, upper body writing posture is optimized by keeping the back and neck as straight as possible, and viewing the paper by looking downward with the eyes. However, even this posture requires some flexion of the head and upper neck, requiring isometric contraction of extensor musculature that crosses these joints to hold the head in an imbalanced posture of flexion (**Figure 1C**).

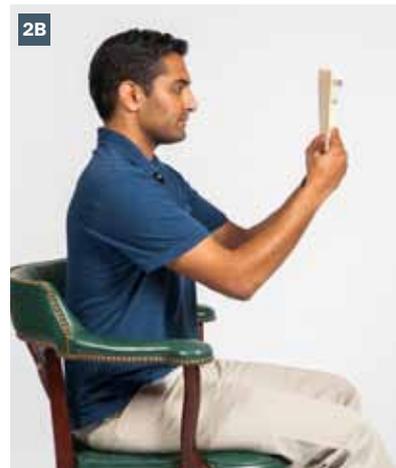
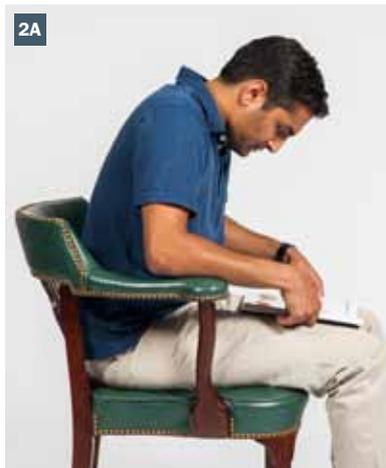


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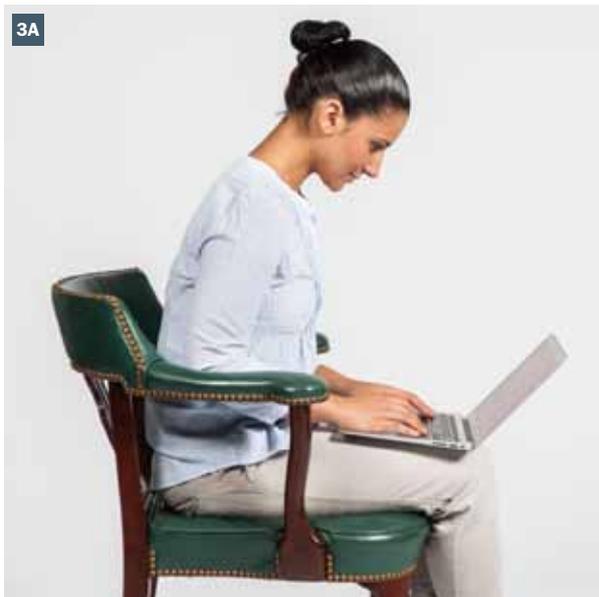
Book.

Reading a book (or magazine or e-reader) can present a similar postural challenge. Most people hold the book in their lap. Similar to writing on paper, this invites a rounded and slumped posture (**Figure 2A**). If instead we hold the book up in front of ourselves by flexing the arm at the shoulder joint, the deltoid must isometrically contract, leading to its overuse and fatigue (**Figure 2B**). Further, the position of unsupported arm flexion requires stabilization of the scapula, which in turn requires isometric contraction of the upper trapezius, leading to its overuse and fatigue, and therefore likely pain. A better alternative is to rest and support the arm that is holding the book by placing it on the opposite-side forearm (**Figure 2C**). If the book is large and heavy, then it is best to use a bookstand (**Figure 2D**).



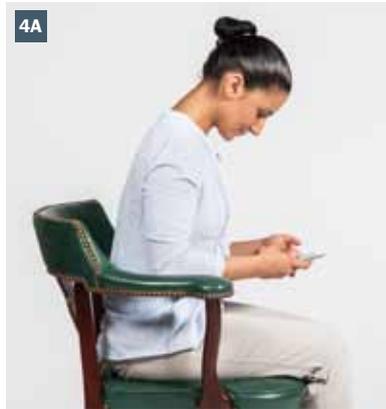
Laptop.

Because of the increased power of laptop computers, many people use a laptop not only for its portability and ease of use when traveling, but also at home in place of a desktop computer. This tends to be problematic for the posture of the upper body because the screen of a laptop is married to the keyboard, therefore it is not possible to place both the screen and keyboard at each one's ideal height. If the screen is set at eye-level, the keyboard will be too high, requiring us to elevate our shoulder girdles to write/type; this will cause fatigue of the upper trapezius and levator scapulae musculature. If instead we place the laptop lower so that the keyboard is at its ideal height, the screen will be too low, inviting a rounded and hunched posture of the neck and upper back. Hunched posture with a laptop is usually most exaggerated when the laptop is actually placed on the lap (**Figure 3A**). Although it is difficult to achieve ideal posture when using a laptop, optimal laptop posture is achieved when it is placed on a desk with the keyboard at the height that allows the arms to be relaxed and vertical (with forearms supported and resting on arm rests). This allows for the neck and head to be as vertical and balanced on the trunk as possible (**Figure 3B**).



Cell/Mobile Phone.

As technology improves and cell/mobile phones permit more and more computer functions to be performed on them, their use becomes even more widespread. Unfortunately, cell phone posture tends to be even worse than laptop posture. Whereas a desktop and laptop can be placed on a desk, cell phones are most often held lower, on or near our lap. This results in the screen being oriented primarily horizontally, causing us to flex/hunch our head, neck, and upper back down toward it (Figure 4A). If a desk, table, or other surface is available, it is better for our posture to use this surface to support our arms (Figure 4B). If a desktop or other surface is not available, then we can still comfortably bring the cell phone up closer to our eye level by placing our arms in front of ourselves and supporting them against our trunk while we read or write/type on the phone (Figure 4C). If we only need to view the cell phone, or are comfortable writing/typing with one hand, we can hold the cell phone in one hand similar to how a book can be held (see Figure 2C).

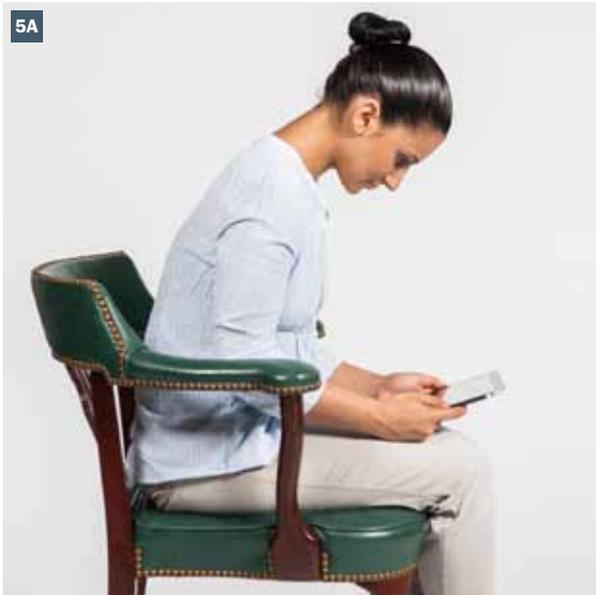


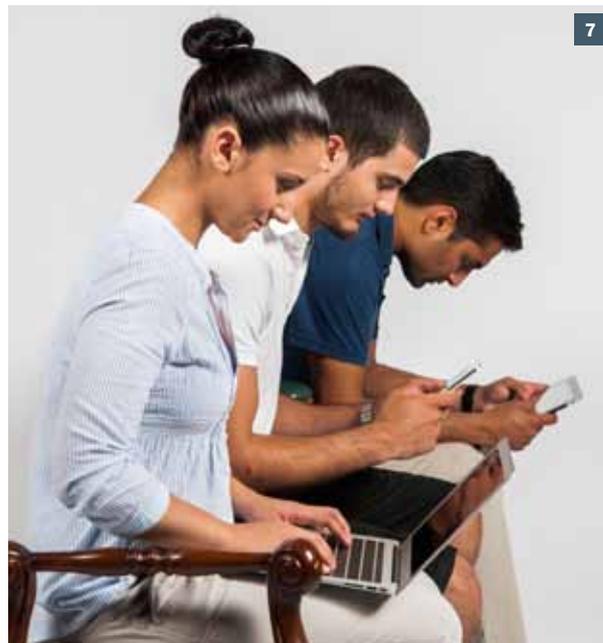
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Tablet.

Using a tablet involves the same postural dilemma as a cell phone. However, because a tablet is larger and heavier, it is more difficult to support. As a result, a tablet is often held even lower than a cell phone, resulting in even more bending/hunching (Figure 5A). When using a tablet, it is a good idea to place it in a case that both has an external keyboard that allows for a more comfortable posture when writing/typing, and that places the tablet screen in a more vertical position that faces us so that we do not need to hunch forward as much to view it (Figure 5B).





Desktop.

When we compare these methods of reading and writing to the use of a desktop computer, we see that a desktop computer is likely the wisest choice because it allows for the best posture of the upper body. The screen can be placed directly at eye level in front of the body so that the neck and upper back can remain straight and balanced; and the keyboard and mouse can be placed at the proper level and location that allows for the optimal posture of the shoulder girdle and upper extremity (Figure 6A). Of course, the fact that a desktop computer allows for better

posture does not necessarily mean that everyone actually assumes healthy posture when working at a desktop. Unfortunately, many people do not optimize the proper placement of the screen, keyboard, mouse, and chair. And even when the placement of everything is correct, many people have the habit of hunching forward anyway (Figure 6B).

The actual quality of our posture when using a desktop, or any other method of reading and writing/typing primarily depends on whether we choose to optimize our positioning so that our upper body posture is as

healthy as possible. However, when we look at how each method facilitates healthy or unhealthy posture, we see that the advent of desktop computers has actually allowed for better posture over the days of pen and paper. Ironically, as computer technology has improved and we increasingly use laptops, cell phones, and tablets, it seems that the postural advantage of desktops is gradually being lost because these new devices tend to cause a return to a more flexed and hunched posture (Figure 7). ■



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