AJNR

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AJNR Am J Neuroradiol 2011, 32 (4) 613-614
doi: https://doi.org/10.3174/ajnr.A2228
http://www.ajnr.org/content/32/4/613

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Editing is a mostly lonely activity, with many hours spent staring at the computer screen and keyboard. Although most editors I know are men, women are much more facile with words, spoken and written. Women speak an average of 7000 words per day, whereas men average only about 2000.[1] This difference is even present in young girls, who tend to be more linguistically gifted than their male counterparts. Additionally, women are better communicators because they have a larger catalog of facial expressions and body movements.

Regardless of sex, if we type the way we talk, all of us do a lot of typing. For most of us in the medical field, typing is an activity as important as speaking and one of the most practical and useful skills to possess (I have come to the conclusion that I learned only 2 truly practical things while in elementary and high school: English and typing). The average person can easily type between 30 and 70 words per minute, and, as they say, practice makes perfect; or as the famous nonfiction author and Princeton professor John McPhee said, "Writing teaches writing."[2]

To write, most individuals nowadays use a keyboard (very few still handwrite). The computer keyboard became popular in the early 1980s and was adapted from IBM's widely used electric typewriters. Initially, it had 83 keys of varying sizes, closely spaced without clear horizontal or vertical separations.[3] In this first computer keyboard version, there was no alphanumeric keypad and the function keys were grouped on the left side. The next iteration, called the 84-key version (also known as the AT keyboard), added the alphanumeric pad on the right side. In the mid-1980s, the number of keys was expanded to 101 and the function keys were relocated to the top row where they remain. Variations with 102 or 103 keys were briefly manufactured before settling on the current 104 keys (the extra ones generally serve to access specific Windows functions). So-called ergonomic keyboards split the keys at the middle, curving and separating them slightly, something I cannot get used to. The keyboards in notebook or portable computers have been redesigned for economy of space, making them somewhat more difficult to use. Another problem is that there are no standardized arrangements for keyboards on portable computers, making them all slightly different.

The most common keyboard layout, used for the English language, is called "QWERTY." This name comes from the order of the first 6 keys in the upper left-hand corner of the keyboard. Why the keys are arranged this way no one is sure. Around 1875, the first keyboards for typewriters were created and their keys were alphabetically arranged. It is said that Christopher Latham Shore, an early inventor of the typewriter, changed them to the QWERTY configuration to make it more difficult to type fast and jam the key bars.[4] Because we are all used to this somewhat bizarre key arrangement, manufacturers do not want to change it.

In the mid-1930s, Dr. August Dvorak, an efficiency expert, studied the way people type and created a different keyboard arrangement (called the American or Dvorak Simplified Keyboard) that groups the most commonly used keys in the areas that are the easiest to reach. Experts prefer it because it is more efficient: In the regular keyboard, about 30% of key presses occur centrally against 70% in the Dvorak type. Muscle fatigue from typing is thus minimized by using the Dvorak keyboard. The truth is that, unfortunately, it is very difficult to switch to the Dvorak keyboard after learning the QWERTY one. Many argue that because standard computer keyboards are direct descendents from old typewriters, they are not matched to the potential offered by computers. The most typical examples of this inheritance are the wide space bar located in the lowermost row of keys and the shift key. In typewriters, the latter was used to shift the carriage (or basket) so that the part of the type bars containing capital letters would strike the paper (thus "shift lock" is now more appropriately called "caps lock"). Another change needed in the computer era was the addition of separate keys for zero and the number 1 (before, you could use the letter *O* and a capital *I* for zero and 1, respectively).

The fact that keyboards used to be attached to computers via wires never bothered me, but companies decided to give their customers greater freedom (to type where?), and most keyboards nowadays use radio-frequency (including Bluetooth) or infrared devices to achieve this autonomy. Not only are most inexpensive wireless keyboards slower than their wired counterparts, you also need to buy batteries for them and for your wireless mouse. Of course, as voice recognition improves, keyboards may begin to lose their importance.

Most European countries use the same standard alphabet and Roman numerals used in English (called American Standard Code for Information Exchange or ASCII characters). In the German keyboard, the only difference is that *Y* and *Z* positions are swapped, leading to the QWERTZ keyboard arrangement. For French-speaking countries, the keys for *A*, *Q*, Z, *W*, M, and *N* are in different locations (hence the AZERTY keyboard). Because languages other than English commonly use accents, a combination of key strokes is needed to display them using the QWERTY keyboard. ASCII includes 31 characters. These are the characters found in most keyboards (full-sized or portable) throughout the world. Other characters no longer used or adapted to the ASCII code are included in the Extended Binary Coded Decimal Interchange character set (designed by IBM) and the z/OS UNIX.[5] Because different alphabets have different character counts, keyboards in other languages have a variable number of keys (101–105). A reduced number of keys is found in mini-keyboards, sometimes called "thumb boards" or GKOS keyboards (such as the ones for BlackBerrys and similar devices). "Dead keys," found in some keyboards, may be "revived" by assigning them specific functions such as accents or special characters.

The additional alphanumeric (or simply numeric) pad of the keyboard is found only on desktop computers and, for purposes of space-saving, is not included in most portable ones. Most conventional keyboard functions are accomplished by mechanical levers and electronic switches.

Other variations of keyboards include those found in touch screens, which are becoming more popular with tablet computing. Touch screen keyboards are considered the natural evolution of "on-screen" keyboards, in which an image of the keyboard appears on the screen and keys are selected by clicking the mouse. Foldable or flexible keyboards are made of plastic or silicone and are great for traveling. They can be attached to computers and other devices such as cellular telephones.

Flexible keyboards are also ideal for hospitals and laboratories because they can be washed and disinfected, and the absence of crevices between keys makes them "cleaner." Britain's *Daily Mail* newspaper reported that computer keyboards have more than 150 times the acceptable number of germs and are 5 times dirtier than a toilet (a fact to keep in mind when you are eating your sandwich while typing or surfing the Web). In a study performed here at the University of North Carolina, computer keyboards housed in the Burn Unit were found to be uniformly infected with coagulase-negative *Staphylococcus* organisms, a common source of hospital-acquired sepsis.[6] Diphtheroids were present on 80% of those keyboards, and are particularly dangerous for immunosuppressed individuals such as those with extensive burns. Commercial cleaners maintain keyboards bacteria-free for about 48 hours. A benefit of one of the most intriguing new keyboards, the holographic or projection keyboard, is that the flat surface used for its projection can be easily cleaned. A laser projects an image of a keyboard onto any flat surface, detects keystrokes, and even simulates the clicking noise of a conventional keyboard. These are truly virtual keyboards, and miniature versions that can be used with smart phones have just hit the market. It does not matter which keyboard you use or prefer as all contain some bewildering keys.

One of the most commonly used keys is the "at" symbol, @, which shares the number 2 key in the QWERTY arrangement. @ means simply "at," "located at," or "at the rate of." @ has been present in keyboards since 1885 but became ubiquitous in the early 1970s when used in the first e-mail messages. In other languages, the @ symbol is more colorfully named (eg, "snail" in Italian, "monkey tail" in German, "dog" in Russian, and "little mouse" in Chinese).[7] In Spanish, Portuguese, and French, @ denotes an old measure of weight (the arroba) and is called "arrobas" or "arrobase" (French). @ is probably of Italian origin and was initially used by Venetians to designate the amount of weight contained in an amphora. Currently, @ is most commonly used in e-mail addresses to separate the name of a person from the domain in which the address is located. In text messaging, @ may serve as a substitute for "at." Recognizing the importance of @, in 2010 the Museum of Modern Art in New York City admitted this sign into its architectural and design collections.[8]

Although substituting @ for "at" does not save me many keystrokes, using "&" instead of "and" is more economical. The ampersand, &, means "and per se and" or more simply "and." & dates back to the first century of the Common Era and its shape has been progressively changed by the Romans and French. The ampersand should not be used to mean "et," which is generally symbolized by "7." When handwritten, the ampersand looks a bit different: ⁊ (sometimes the vertical line is left out). Regardless of its exact shape, I think the ampersand is one of the most elegant and practical symbols used in language.

The number sign, #, is probably used as commonly as @ and &. It is usually used to designate a numeric position such as the following: *AJNR* is the #1 journal in clinical neuroimaging. In the United States, # is called the "pound" sign, whereas in other countries, it is simply known as the "number" sign (scientists sometimes call it the "octothorpe").[9] Calling it a "pound" sign may lead to confusion in England, where the pound sign is £. Thus in England, # is called the "hash" sign. In Spanish-speaking regions, the number sign is generally "N°." In Spanish, # has many names ("almohadilla," "cardinal," and even "tic-tac-toe"). The musical symbol "sharp" is nearly identical to #, but its 2 horizontal bars are angled upwards from left to right. A fact that is interesting to editors is that in copyediting, ### means that more content will be added or that mistakes that need to be corrected are found in the text. ### at the end of a manuscript means no further information is forthcoming. Chess fans know that # after a move means "checkmate."

Last, a few words about keyboards and health. I now spend more hours in front of my computer screen typing than ever before. Strain to your wrists, arms, back, and neck from typing may cause pain. Keep your shoulders in a relaxed position, your elbows at about a 90° flexion, and your wrists and back straight. Get to know your keyboard and play it like a piano: Do not rest your palms or wrists on anything. Take short and repetitive breaks throughout the day. They are good for the body and the mind.

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DOI 10.3174/ajnr.A2228

EDITORIAL

Can Meta-Analysis Save Vertebroplasty?

Last February, I was asked to testify in front of the California Technology Assessment Forum (CTAF), a public service forum composed of numerous California physicians and