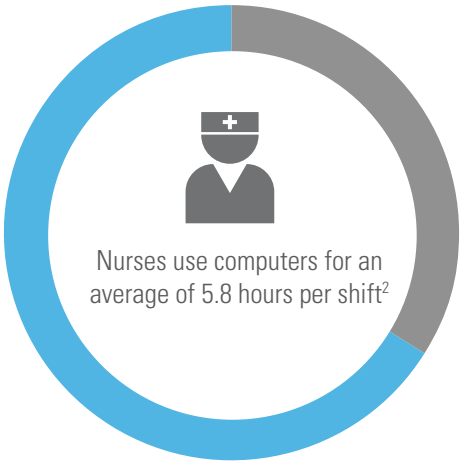
The Art of Automation: Ergonomic Carts Come of Age



Healthcare professionals work at some of the toughest jobs in the U.S. Comparisons between nursing and other professions reveal that nurses are 200% more likely to suffer from work-related injuries than construction workers,[1] and have a rate of musculoskeletal disorders seven times the national average. Long hours, shift work and fatiguing tasks are compounded by an influx of new technology and requirements for usage. In an industry that has been historically paper-based, skilled caregivers who already have high demands on their time are now required to spend as much time on computers as the average office worker, while seeing more patients than ever. A recent U.S. study found that physicians now use computers for an average of 5.1 hours per shift, and nurses use computers for an average of 5.8 hours per shift.[2] As a result, multiple studies show that as many as 90% of nurses are working with discomfort.

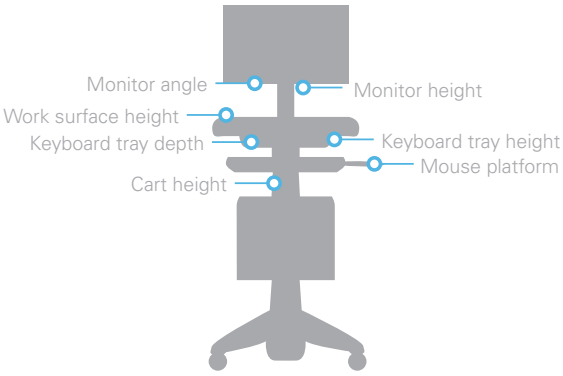
90% of nurses report discomfort[2]

Ergonomics guidelines can be applied to the design of computer workstations to improve the fit and the experience for the user. Ergonomics is the science of improving the fit between the task and the user to maximize productivity while reducing discomfort, fatigue and injury. We can improve the fit between the user and the equipment by designing it to accommodate the widest range of users possible and, traditionally, by increasing adjustability. However, in healthcare, when the workstation becomes a mobile cart, we have to consider the fast-paced nature of the job and the time caregivers are willing to take to make adjustments to equipment. The natural solution lies in systems that can automate the adjustment process and naturally fit users with limited input required.

TECHNOLOGY CARTS IN HEALTHCARE

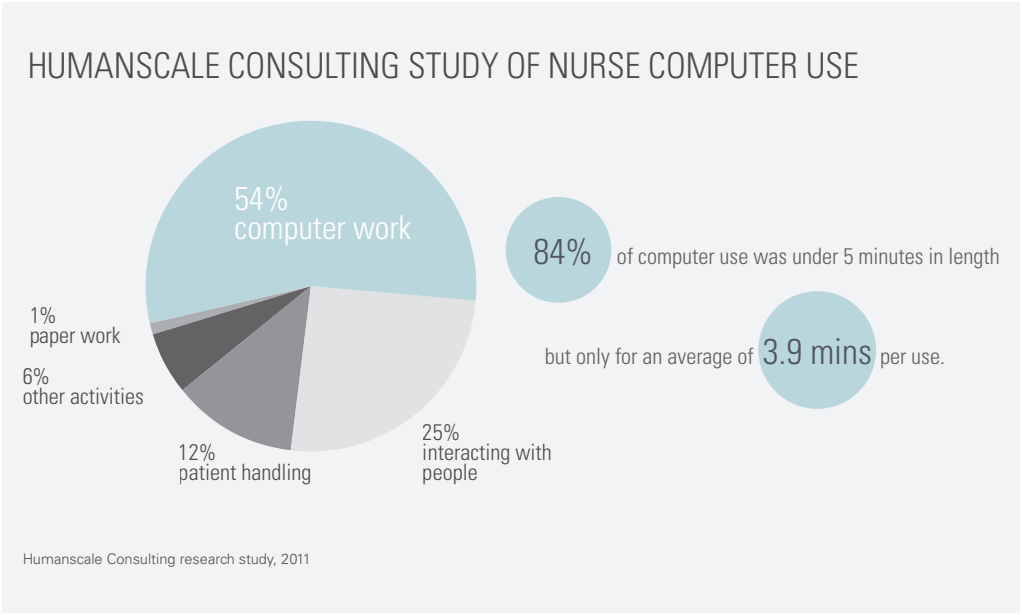
Mobile technology carts are intended to support caregivers during their highly mobile workflow and must not interfere with the evolving collaborative nature of care. At a fundamental level, carts should provide a platform to mobilize the nursing staff and support them and their technology in a comfortable and efficient manner. The goal of introducing computers, electronic medical records and mobile technology carts to the healthcare setting is to create a supportive, high-performance work environment that improves caregiver efficiency, increases time spent on patient care and improves patient safety. But due to the complex nature of workflow requirements coupled with equipment design flaws, simply mounting a computer on a cart is not a solution to improving caregiver performance, and may in fact inhibit efficiency.

Mobile technology cart with no adjustability



Mobile technology cart with too many adjustments

The first mobile technology carts, in addition to many designs that are still in use today, offered little or no adjustability. These tools did not adjust to accommodate individual differences of users and created situations that resulted in increased discomfort among caregivers, and increased distractions and impediments to patient care. In an attempt to combat the poor fit and function of these carts, a second generation of "ergonomic" technology carts evolved that offered high levels of adjustability. Due to the fast-paced nature of the nursing profession and high percentage of multiple users sharing technology, these system with too many adjustments resulted in adjustments not being made. The design was misguided by a poor understanding of caregiver workflow and computer use.



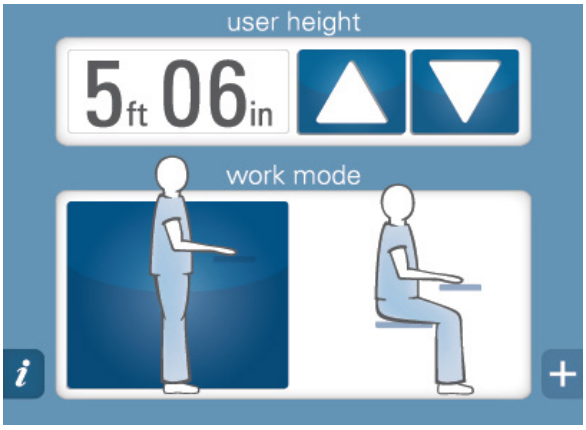
A 2011 study by Humanscale Consulting found that nurses used computers for an average of 54% of their shift—more time than they spent in direct patient care. However, each interaction at the computer lasted an average of 3.9 minutes. In fact, 84% of computer use was under five minutes in length. This means nurses use computer workstations more than 100 times every day. In addition, computer carts were only adjusted by 15% of new users. Considering these carts required six adjustments to fit each user, it should come as no surprise that carts were adjusted infrequently. Exposure time and likelihood of adjustment are linked, and, although each cart use was short, short exposures to awkward postures at computers are cumulative leading to an increase in reported musculoskeletal discomfort.

THE CASE FOR AUTOMATION

Based on what we know about the perils of having too much or too little adjustability, the solution can be found in automation. Selecting and investing in tools that make complicated adjustments quickly and automatically saves caregivers time, reduces physical risk and improves efficiency of care.

AUTOMATIC FIT

The easier something is to use, the more likely it is to be used. As the research shows, the average cart requires six different adjustments, and caregivers spend an average of less than four minutes at the cart per use. The T7 mobile technology cart utilizes AutoFit™ technology to eliminate a number of steps to the process of adjusting the cart. Minimal user input is required to ensure that the cart fits everybody every time. An electric height-adjustable cart moves quickly and gives the user instant results, allowing more time to focus on patient care.



The T7 mobile technology cart's AutoFit technology takes the guesswork out of adjusting the keyboard and work surface to the correct and comfortable height for seated or standing work. Pre-programmed with anthropometric data to fit at least 95% of users, the cart requires the user to simply input his or her height and it will automatically adjust to the ideal height and promote a neutral, supported posture throughout seated and standing computer and paper work.

INTUITIVE ERGONOMIC DESIGN

Design features that are often overlooked have the potential to either increase or decrease physical risk factors for discomfort and injury. Recent studies show that more than 40% of nurses experience discomfort in their right hand and wrist.[3] Discomfort rates among physicians are nearly as high. A significant risk factor for wrist and hand discomfort is use of a keyboard platform that forces the wrist into extension, which can increase carpal tunnel pressure and encourage wrist anchoring. By using a keyboard platform with a negative slope, all users are able to maintain a straight and neutral wrist position, reducing or eliminating risk of discomfort.

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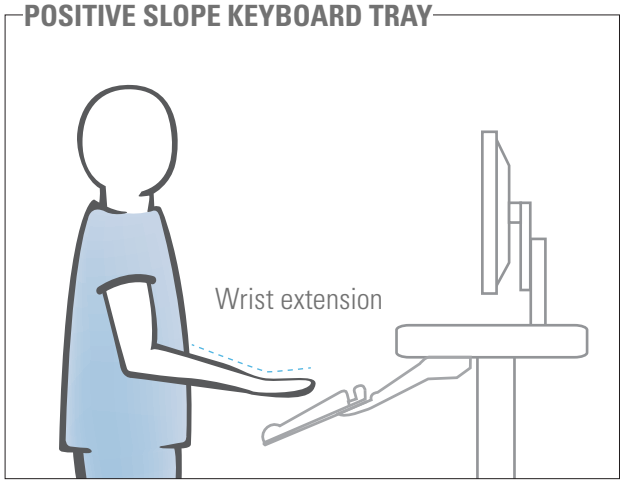
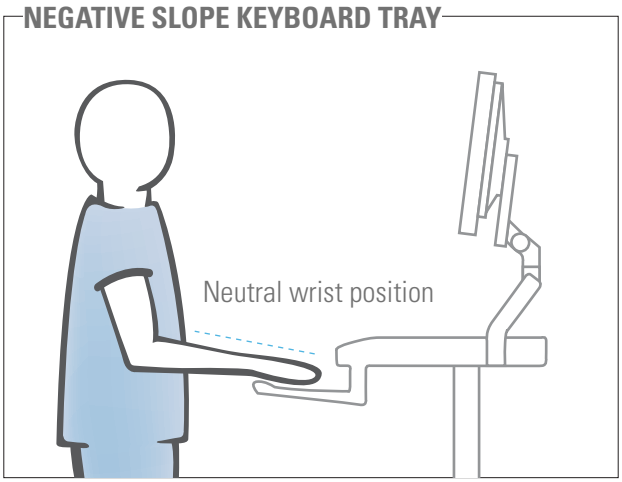
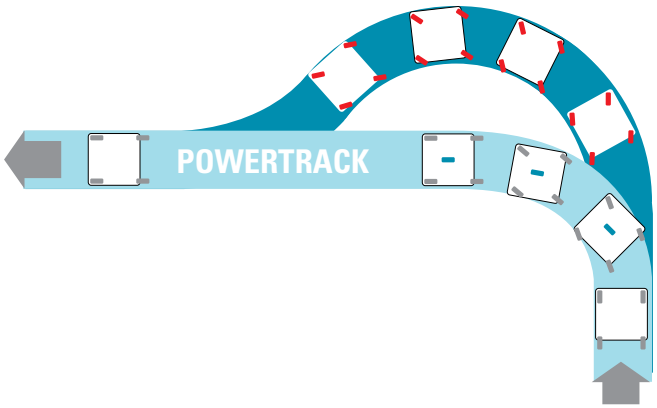




With space at a premium, the healthcare setting is an environment that can benefit from the evolution of technology to smaller, more portable units. Modern ergonomic cart design makes the most efficient use of all available space by offering a compact footprint with no peripheral tools such as a swing-out mouse platform or work surface to impede movement or require an additional adjustment to use. When a user walks up to the cart, all tools should be automatically available and immediately ready to use to improve efficiency of care.



POWERFUL MOBILITY

Mobile technology carts support caregivers' highly mobile workflow because they integrate technology at the point of care. But, in addition to the five miles per day that nurses travel, pushing a heavy cart laden with technology presents a clear risk for increasing fatigue. In fact, most major medical carts weight at least 100 pounds when unloaded, and much more when loaded with power and technology. These carts require exponentially more force just to move, and even more to stabilize and maneuver in cramped quarters. Healthcare organizations can reduce the risk for nurse injury and fatigue by choosing a cart that pulls its own weight. The T7 mobile technology cart's PowerTrack™ steering engages a centralized fifth wheel that focuses the center of mass of the cart, requiring less force to steer and navigate. By minimizing strain, fatigue and exhaustion, the caregiver is then able to focus on what matters most: the patient.

THE BENEFITS OF AUTOMATION

Automating the design of the mobile cart in healthcare promotes healthy working postures for all users who interact with the cart during their shifts. Eliminating the confusion of making many adjustments allows nurses to spend their time focused on their patient and their job rather than frustrating tool adjustments.

Trends are emerging in the type of technology used in healthcare and the physical design of the space in an effort to save money and increase efficiency. Yet among all these changes there is one thing that isn't changing–the human body.

By investing in tools that provide automatic fit and improve function, healthcare facilities can introduce simplicity into caregiver workflow and obtain far-reaching benefits. These tools increase productivity on tasks and efficiency of movement for nurses and physicians using them. They automatically fit the body to reduce the risk of increased discomfort or even injury, thereby reducing lost work days or skilled staff. Improving caregiver performance improves patient experience, outcomes and satisfaction. Improving patient satisfaction and outcomes then affects reimbursements, patient enrollment and staff turnover. Investing in ergonomics is investing in your organization.

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1 Bureau of Labor Statistics, 2010

2 Alan Hedge & Tamara James, "Ergonomic Issues of Computer Use in a Major Healthcare System," Advances in Human Aspects of Healthcare, Jul 2012: 259 -268

3 Hedge & James 2012