

## NAVAL MEDICAL CENTER SAN DIEGO PHARMACY RESOLVES ERGONOMIC RISKS OF PROLONGED STANDING

Naval Medical Center San Diego (NMCS D), the largest health care facility in the United States military, provides health care to active duty and retired military and their families. NMCS D pharmacists, with the assistance of pharmacy technicians, fill nearly 8,000 prescriptions a day.



Prescriptions are dispensed from the NMCS D pharmacy kiosk.

Pharmacy technicians receive prescriptions and give out prescribed medications at walk-up windows or kiosk stations. Procedures and the amount of time required to process a prescription vary with the type and quantity of medication. Controlled medications, for example narcotics, take the most time due to rigorously

regulated documentation and tracking procedures. However, the pharmacy averages approximately ten minutes per prescription.

After completing the required paperwork for each prescription, a pharmacy technician retrieves a prescription container and the bulk container of medication, labels the bottles, and transfers the quantity specified into a suitable prescription bottle or jar for individual use (the pharmacist fills or checks prescriptions on all controlled substances). In order to retrieve a bulk container, technicians often had to stretch to reach bulk containers that were stored on six foot high shelves or bend down to retrieve containers that were stored as low as ten inches from the floor. In addition to these long vertical reaches, technicians also had to stretch out, past the workstation desk top that serves as a work table to reach for supplies.



Pharmacy technicians document prescriptions and bottle medications from bulk containers.

Technicians stationed at the walk-up window were required to stand throughout the day. These technicians wear comfortable soft-soled shoes. A hard sole shoe does not give or bend much as a worker sways and therefore results in pressure points that could reduce circulation. A

softer sole tends to increase the cushion between the sole and floor,



Prolonged standing can lead to discomfort of arms, shoulders, back, and legs.

allowing greater circulation in the feet. A softer sole also increases the amount of circulation through the foot by allowing the worker to sway slightly from back to front. However, even with these shoes, technicians frequently experienced fatigue and back, leg, and foot discomfort by the end of a work shift.

Awkward movements and postures, such as extended reaches and prolonged standing, can lead to discomfort of the arms,

shoulders, back, and legs. Standing for long periods can result in the pooling of blood in the legs and feet, resulting in aching and fatigue. Frequent, repeated, or lengthy exposures to such risk factors may not allow for adequate rest and recovery of fatigued muscles. When that happens, the worker may develop a *Work-Related Musculoskeletal Disorder*, or WMSD, the designation for a group of disabilities that usually involves weakness and discomfort. The discomfort due to a WMSD often improves following medical treatment and changing work habits in order to discontinue the activities that led to the symptoms.

The above problems for technicians in the NMCS D pharmacy were related to ergonomic risk factors. *Ergonomics* is the science of fitting the work to the worker, instead of requiring the worker to adapt to existing working conditions. Tasks, equipment, and tools that are designed with the user and task in mind help to reduce the risk of WMSDs and other work-related injuries by allowing the worker to avoid harmful repetitive motions, awkward or unnatural postures, excessive immobility, and repeated forceful pressure on susceptible parts of the body. Applying ergonomic principles in the workplace also increases productivity and efficiency, reduces errors and waste, increases worker satisfaction and workplace morale, and ultimately improves overall quality of work and products.

The goal of the Navy's *Ergonomics Program* is to reduce the frequency and severity of WMSDs by redesigning work tasks or workstations through the introduction of procedures and tools that minimize ergonomic risk factors. NMCS D participated in an Ergonomics Risk Assessment Project funded by the *Chief of Naval Operations' Hazard Abatement and Mishap Prevention Program* to improve occupational health and safety conditions

by identifying ergonomic risk factors in the workplace and resolving them by implementing suitable ergonomic solutions. At the request of NMCS D, a Certified Professional Ergonomist (CPE) provided technical support to the project.

At the onset of the NMCS D Ergonomics Project, the CPE and NMCS D safety staff observed pharmacy staff members carry out their usual work tasks. They also interviewed pharmacy technicians, supervisors, and NMCS D industrial hygienists to pinpoint possible ergonomic risk factors. The CPE distributed *Job Requirements and Physical Demand Surveys* (JR/PD) to the pharmacy staff. The JR/PD is an occupational health survey that the military utilizes to identify risk factors in various work environments and to identify and prioritize resolutions. The results of the overall ergonomic assessment and JR/PD indicated the presence of ergonomic risk factors for technicians working at pharmacy walk-up windows.

The pharmacy staff, CPE, safety office and industrial hygienist analyzed the data and results of the site survey and brainstormed ideas to reduce the risk exposure level. The workers themselves had some good solutions. The workers suggested moving commonly used supply items to the center and lower shelves to reduce reaching. They also recommended anti-fatigue matting be positioned throughout the pharmacy walking areas, instead of only in front of the kiosk stations.

To relieve some of the strain from continually standing, the CPE suggested a product called a lean or sit/stand stool. A sit/stand stool provides the support of a stool while still allowing the same mobility and ability to reach as standing. The survey team decided to test three different styles of sit/stand stools all with pedestal bases that do not protrude, minimizing tripping hazards.



Sit/stand stool provides support while allowing mobility.

The pharmacy staff evaluated the sit/stand stools for three weeks then completed an anonymous equipment survey. The results of the equipment survey were used to select the sit/stand stool currently in use at the pharmacy. The NMCS D staff is more likely to use the equipment, because they were an integral part of the selection process. A follow-up

survey by the safety staff and the CPE found that NMCS D pharmacy technicians feel that using the sit/stand stools has reduced fatigue.

The pharmacy technicians alternate between sitting and standing.



NMCS D pharmacy technicians report less discomfort and fatigue at the end of work shifts when they wear soft-soled shoes, do stretching exercises, and alternate standing with sitting on sit/stand stools.

Alternating allows the muscles stretched during one posture or task to have a chance to recover. While standing, the technicians use footrests, which allow them to alternate between putting weight on the leg supporting their bodies and the leg on the footrest. Being able to alternate the supporting leg allows the muscles on the supporting leg to rest.

Alternating also allows workers to assume a variety of standing postures, which minimizes the strain on any single body part

and improves blood flow from the legs by preventing pooling of blood in the feet and resultant swelling. NMCS D pharmacy technicians continue to wear soft-soled

shoes, which makes a difference in their overall degree of fatigue at the end of their shifts. The combination of soft-soled shoes and the sit/stand stools greatly increases worker comfort level while decreasing risk of WMSDs.

Pharmacy technicians also stretch for a few minutes during their breaks to alleviate stress on back, leg, and feet by increasing circulation and allowing time for muscles used during their tasks to recover. Stretching tends to prevent muscle soreness and stiffness while increasing flexibility. NMCS D's web site provides further information on the benefits of stretching during work breaks.

<http://www.ucsc.edu/opers/wellness/pages/officestretches.html>

Commonly dispensed medications are now stocked at the NMCS D pharmacy no more than four feet high and no lower than 20 inches from the floor. A step stool has been provided for medications stored outside this range. The stepstool is on casters so it can easily slide into place and castor locks keep it in place when weight is applied to the step stool. Anti-fatigue matting has been distributed along the entire walkway of the kiosk workstation and along the work benches, creating a soft, uneven

surface that promotes an imperceptible anterior-posterior and lateral sway of the body (center of gravity, like an inverted pendulum). The sway or rocking relieves pressure on the bottom of the foot and aids circulation

The JR/PD was redistributed to the pharmacy technicians after the new equipment was in place for six months. The survey results showed a decrease in the prevalence of discomfort and severity of exposure to risk factors in the shoulders and neck body region. Verbal communications with the pharmacy technicians confirmed a decrease in the perceived feeling of fatigue at the end of the day and their overall satisfaction with the sit/stand stools, anti-fatigue matting, and foot rests.

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