

Robotic Refillers



The Joint Refill Processing Center takes advantage of robotics to improve pharmacy service. The systems allow pharmacy staff to concentrate on patient care and new prescription services instead of refilling existing orders.

By Mickey McCarter

The Pike's Peak Joint Refill Processing Center at the U.S. Air Force Academy is the first of five automated refill pharmacy centers planned to open in 2004 and 2005.

The Air Force hosted the opening ceremony for the center on April 13 to introduce the concept of regionalized prescription processing to the Department of Defense (DoD). The processing center currently refills prescriptions for three pharmacies in the Colorado Springs area, extending its reach to five military treatment facilities (MTFs): Evans Army Community Hospital at Fort Carson, the 21st Medical Group at Peterson Air Force Base, Air Force Clinics at Schriever Air Force Base and Cheyenne Mountain Air Station, and the 10th Medical Group at the U.S. Air Force Academy.

Lieutenant Colonel Scott Sprenger, chief of the TRICARE Benefits Branch for the Office of the Air Force Surgeon General, told Military Medical Technology two additional centers are scheduled to open this calendar year, and two more are scheduled for next year.

"The idea is that you take the prescription refill processing out of the individual pharmacies and do it in a centralized location because there's a number of different benefits associated with that," Sprenger said. "Because we were able to add in robotic technology, the workload can be done more efficiently, and it frees up the pharmacy personnel at the local sites to more efficiently take care of their patients and workload at the pharmacy."

The other four sites will be located at Luke Air Force Base, AZ, Nellis Air Force Base, NV, Lackland Air Force Base, TX, and Patrick Air Force Base, FL.

"Congress approved funding for the optimization plan to bring cost savings and efficiency to DoD pharmacies," Sprenger said. "Pharmacy staff will now have more time dedicated to filling new prescriptions, which is the most difficult work they do, and beneficiaries enjoy greater flexibility in their service."

Although the refill centers fall under the responsibilities of the Air Force, the first center supplies Fort Carson as well as Air Force assets. As such, the Army provides some of the pharmacy staff to work at the center.

"The current manning arrangement allows for and requires some assistance from all the participating pharmacies," Sprenger said. "Participating pharmacies send some of their manpower, but not as many people as were required to process all their refills before."

Optimization

"The idea of the joint refill processing centers began in 1999 when the TRICARE Management Activity (TMA) and the DoD Pharmacy Board of Directors began looking at ways to maximize the pharmacy resources within DoD. TMA conducted a reallocation study to identify methods that could be implemented to improve DoD pharmacy resource utilization," Sprenger explained.

"They really focused on the refilling process," he said.

Congress approved \$25 million to the Air Force to implement DoD pharmacy reforms, leading to the creation of the Air Force Pharmacy Optimization Project. The optimization of the outpatient pharmacy filling process included not only the joint refill processing centers but also upgrading pharmacy automation in general and standardizing medical error reporting.

"We completed the standardized error reporting piece and are about 97 percent finished with the pharmacy automation at the local level," Sprenger said.

Meanwhile, the activation of the joint refilling processing centers brings many visible advantages for everyone involved, Sprenger said.

First, regionalizing and automating the refill process boosts the emergency readiness capabilities at local bases. Pharmacists now have improved local pharmacy inventory management, Sprenger noted.

"This concept ensures that medication inventories required for military deployments and local disasters are readily available to military treatment facilities on short notice. Combining the prescription refill inventory for several military facilities within a close geographic area will decrease the overall inventory requirements while increasing the actual inventory available to any one facility," he said.

Second, the processing centers improve the quality, accuracy and safety of refills, Sprenger said.

"It uses high-tech robotic technology equipment with prescription-checking software that maximizes safety," he said.

Third, the joint refill processing centers can free up staff and space at the MTF pharmacies by taking the refilling process out of the pharmacy. "When that workload was diverted out to the refill center from Peterson AFB, it freed up a whole section of the pharmacy, including a window, allowing them to improve workflow and reduce their local waiting times for new prescription processing," Sprenger said.

Beneficiaries not only discover shorter waits at the pharmacies, but they also gain the freedom to pick up their prescription at different locations.

"In the case of the existing refill center, beneficiaries can elect where they want to pick up their prescription and it's processed and sent to that specific location," Sprenger said.

Automation

Air Force pharmacy representatives began research into automated pharmacy systems as early as 1999, according to a report from the General Accounting Office. Objectives were established with safety as the first priority. Dispensing criteria were developed and automation equipment specifications determined. Only a select few companies manufactured the systems, and by 2001, Air Force pharmacy had developed a clear preference for robotic systems from Innovation Associates, Johnson City, NY, as the only one available that met its needs.

In 2003, the Air Force procured the PharmAssist robotic system from Innovations Associates for its academy refill center pharmacy after determining the system met four core requirements:

- Compliance with Air Force communications security requirements.
- Programmable dispensing units that eliminate the need to exchange/ship counting unit component(s).
- Availability of the optical original prescription image when checking the refilled prescription.
- No cross contamination between medications.

The joint refill processing center uses two Robotic PharmAssist systems with 480 dispensers, PharmAssist Symphony software, vial feed/print-and-apply labeling system, pneumatic transport system, vial sealer, multi-level conveyor system, and a variety of manual filling, drug-verification, and drug-packing stations, according to Innovation Associates.

The ability to handle generic substitution requirements was a particularly important factor, Tim Limer, director of software engineering at Innovation Associates, told Military Medical Technology.

Composite Health Care System (CHCS), the defense pharmacy management system, tracks beneficiaries and the drugs they are taking, Limer explained. The PharmAssist system has the ability to scan drugs in that system and verify their generic equivalents to make substitutions.

"You would not encounter that in a civilian pharmacy," Limer said. "In the commercial world, they never do that. They always fill exactly what the pharmacy management system says to fill, but that's because of insurance requirements and things like that, whereas the military does not have that issue."

The PharmAssist system also tracks the order within CHCS and any generic substations that were made, using quality control software to ensure that no mistakes are made in the process.

"Within our system, the military has a record of what actually gets filled," Limer said. "Before using our system, when they were just using CHCS, they actually had no idea of what actually went to the patient. Our system now gives them insight into what is actually going out the doors."

The PharmAssist system consists of three main subsystems, Limer said, the first being the vial delivery system.

"The vial delivery system has a bunch of unique features to it, but one of them is the fact that it can take three different vial sizes and sort them out and have a queue of the vials ready for the robot whenever it needs them," Limer said.

The second part of the system is the robotic enclosure, which resembles an octagon-shaped room where a robotic arm does its work.

"Once the vial is labeled, it is sent over into the robotic enclosure via pneumatic tube," Limer said. "The vial delivery system, theoretically, need not be in the same room with the robot if you didn't want it to be. There is a lot of flexibility in terms of where it sits, as you can imagine, because the only thing that it connects to is this pneumatic tube. It ships it over like the old bank teller systems."

Each individual dispenser within the robotic enclosure has a computer onboard, making it "individually intelligent," which potentially means 360 individual counting devices operate on their own.

"As soon as we get the data from CHCS of the orders to fill, the counters will start counting the orders they can count immediately," Limer said. "There might be 100 orders counted in a robotic enclosure waiting for the robot. The count speed is kind of irrelevant, because the orders are counted waiting for the robot."

Once the dispenser releases the prescription drugs into a vial, the robot seals the vial with plastic and drops the vial into a tote. The final subsystem, a conveyer belt system, then routes the tote around the refill center until it has collected all the prescriptions for one individual beneficiary, Limer said. One tote can hold perhaps 15-20 prescriptions.

"If a patient has five orders, all their orders will be in the same tote," Limer said. "Then the conveyer system, which goes in a loop, routes the totes to the places it needs to go to collect all the orders for the patient."

The tote may travel between the two robotic PharmAssist systems or a manual fill station for orders a pharmacist must fill manually.

"They have a radio frequency tag built into them," Limer said. "The PharmAssist software programs the next place that the tote needs to go onto this little tag and the conveyer system sees to it that it gets there. Once there, the PharmAssist software reads the tag of the tote and then figures out what things it has access to belong

in that tote."

The refill center initially opened from 8:00 a.m. to 5:00 p.m. Monday through Friday and processed from 2,000-3,000 prescriptions daily. It employed a staff of eight to 10 pharmacists and technicians when it opened, as opposed to the 15 to 16 personnel typically required at other pharmacies at military treatment facilities.

Pharmacy staff credit the PharmAssist robotic system with eliminated wrong-drug errors, where a prescription is filled with a medication other than prescribed.

Inspiration

Some advantages of the joint refill processing centers are not unique to the military's implementation of regionalized refilling. As with some other health care initiatives, the DoD consulted with the Department of Veterans Affairs (VA) when initiating improvements to its pharmacy refill system.

"The VA is one example of a government agency that has effectively utilized a regional prescription

refilling process," Sprenger said. "They do all their pharmacy refills through what is called the Consolidated Mail Outpatient Pharmacy [CMOP]."

DoD pharmacy representatives visited and studied the CMOP model for an effective formula for mechanisms to process refills. The reallocation study commissioned by TMA recommended consolidating MTF refills at regional refill centers to capitalize on similar efficiencies as experienced by the VA's CMOP program. Air Force pharmacy took notice and incorporated refill processing into the optimization plan, Sprenger said.

TRICARE's own mail order pharmacy (TMOP) program refills prescriptions using the same idea. Beneficiaries may send their prescriptions through the mail and receive their refills from what is effectively a refill processing center.

"The TMOP is a commercially contracted service center," Sprenger said. "It uses similar automation and processes the refill center uses in terms of processing their refills, but like the CMOP, refilled prescriptions are mailed to the beneficiary."

Because DoD beneficiaries have a choice for which pharmacy venue (MTF, TMOP or retail) to use, the efficiencies of the mail order program do not reach through the department, however, which spurred the application of its innovations to the traditional pharmacy system. Only about 10 percent of the DoD's refill workload goes through the TRICARE mail order program.

"Obviously, beneficiaries choose to come to the MTF pharmacy in the majority of the cases," Sprenger said. "There are a number of reasons for that. They combine their trips to the pharmacy with medical appointments, commissary visits and other kinds of activities on base. The refill center capitalizes on the efficiencies of refill consolidation at the MTF pharmacy, where the majority of DoD's refill workload occurs."

In addition, DoD and VA have also begun some tests to see if VA refill centers could process any of the defense refill workload. The two departments are conducting tests of the concept at one location in each of the military services. The Air Force's test pharmacy for that program is at Kirtland Air Force Base, NM.