Integration of Information Technology and Tech-Check-Tech to Reduce Medication Turnaround Time

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As the complexity of healthcare continues to evolve, new ways of improving safety and efficiency must be continually explored. In order to support the systems designed to care for patients in this evolving model, hospitals and health-systems must have solid foundations grounded in sound operational practices. According to the American Society of Health System Pharmacists (ASHP) Pharmacy Forecast 2017, there are several prominent themes being seen throughout the practice of pharmacy over the next few years, two of which include; 1) continued national pressure for healthcare reform will drive health-systems to pursue microlevel operational improvements, and 2) the integration of information technology will substantially progress.[1] At Froedtert Hospital, these two trends have become part of the driving influence behind recent practice advancements.

Froedtert Hospital (FH) is a 500 bed academic medical center located in southeastern Wisconsin. In order to support patient care, the FH Pharmacy Department established a comprehensive pharmacy service model with integrated decentralized practice within the acute care setting. The Pharmacy Department has been driven to continually assess, improve, and share new ideas within the practice of pharmacy. This has led to the receipt of four ASHP Best Practices Awards since

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2007.

As the clinical pharmacy practice model continues to advance and grow throughout the organization, the Pharmacy Department has begun to pursue the microlevel operational improvements necessary to support patient care needs. The primary way that these improvements have been possible is through elevating the role of the pharmacy technician. Increasing demand for services including management of chronic medications during the inpatient stays and discharge, increasing scope of clinical services, and meeting acuity and volume needs, the technician role has begun to assume some of the historical duties of the pharmacist. One example of this role change is through Tech-Check-Tech (TCT) within the medication distribution processes in central pharmacy. The addition of validated technicians has allowed pharmacists to be reallocated to patient care areas within the hospital while also improving medication turnaround time.

The requirements to become a validated pharmacy technician are focused around experience, didactic training, practical training, and validation of accuracy. In order to qualify as a validated pharmacy technician, the candidate must work on
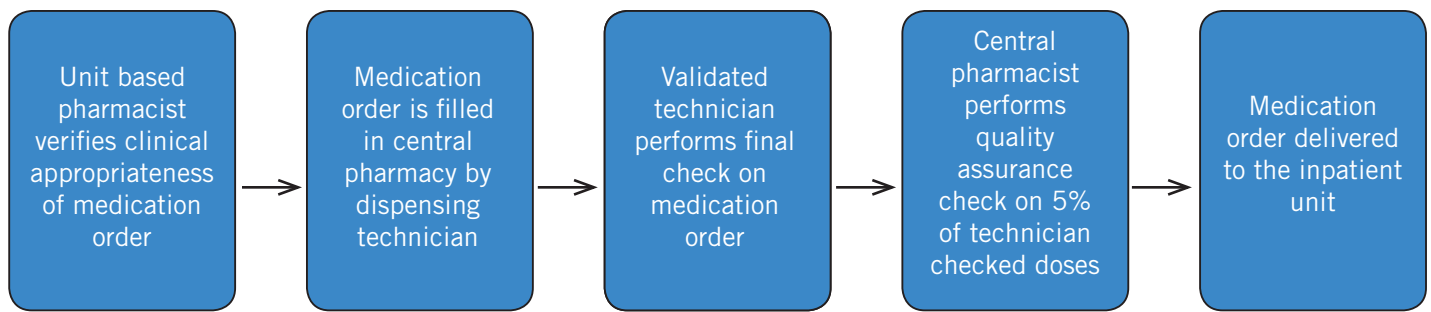
average at least 20 hours per week and be employed 6 months at the pilot pharmacy. In addition, the pharmacy technician must have a minimum of 2000 hours of experience as a pharmacy technician. The validated pharmacy technician candidate participates in didactic course work and practical training that is designed to teach technicians safe medication distribution practices and assess competency. Technician accuracy is assessed over a validation period of at least 5 days and includes a minimum of 1000 doses. During this time the candidate makes the final check on the work of another technician for accuracy and correctness maintaining an accuracy rate of 99.8% or greater. To assure the accuracy rate is obtained, a pharmacist audits 100% of the final checks made by the technician during the validation process.

The TCT process has been an ongoing journey that started with daily cartfill. The cartfill process is run once daily during the overnight shift with one technician picking on average 4,100 doses every night. The product barcode is scanned during the picking process to ensure accuracy. A second technician then barcode scans the product again and visually inspects all of the picked items which accounts for

FIGURE 1. Oral Medication Distribution Process

| Unit based pharmacist verifies clinical appropriateness of medication order | → | Medication order is filled in central pharmacy by dispensing technician | → | Validated technician performs final check on medication order | → | Central pharmacist performs quality assurance check on 5% of technician checked doses | → | Medication order delivered to the inpatient unit |

approximately 40% of the medications that are checked on a daily basis by TCT. All scanning is completed within the automation technology system. In 2015, this process was expanded to include oral first doses across all three technician shifts, requiring an expansion of the validated technician pool from 10 to 24 technicians. All non-controlled oral first doses dispensed through central pharmacy get checked by a validated technician (See Figure 1 for details of the distribution process). Approximately 1,400 first doses are checked every day through this process.

Inpatient TCT programs have historically centered on visual inspection of medication orders. One of the key components to this program, the secondary barcode scan check, was a new approach to TCT that provided a creative way to optimize technology, improve safety, and facilitate workflow. Utilization of the existing inventory software system to complete the scan has allowed:

- Safety: In addition to the standard visual check, scanning allows for the validated technician to check the NDC of the product prepared versus a patient specific order within the inventory management system.
- Quality: Utilizing the inventory management system has allowed electronic tracking of doses checked by each technician. This has significantly streamlined the ability to report quality metrics. The data is easily exported and available in real time to know the number of medications each technician has checked as well as turnaround time.
- Visibility: Scanning has opened visibility to workload and performance metrics allowing visual display of metrics in the work area. The

display allows real-time feedback on performance and the ability to reallocate staff from non-urgent activities when needed to meet turnaround time goals for first doses and STAT orders.

In order to facilitate the scanning workflow, a visual track board has been developed to display real time metrics, as well as information for pending orders, allowing further integration of information technology into daily operations. The track board pulls real time data from the automation management system and aids the validated technician in tracking orders that have yet to be checked as well as total doses scanned throughout their shift. As medication orders cross from the electronic medical record into the automation technology they are displayed on the track board. Once they are pulled from automation they then go to the validated technician for the final check. Once the validated technician inspects and scans the medication it drops off the track board, providing real time feedback on how many orders are still pending fill. The track board also displays scan check totals which aids the validated technician with meeting the requirements of the TCT pharmacist quality assurance check.

Implementation of TCT for first doses as well as the visual display has greatly improved the efficiency of the dispense process. Prior to implementation of the program, average turnaround time in central pharmacy was 42.5 minutes. This time was measured from when the order was received in the automation system to when it was sent to the floor. After development of the TCT program average turnaround time is now able to be differentiated between STAT and first dose. For the period of July 1, 2016 through

Oct 30, 2016 average STAT and first dose turnaround time were 13.1 minutes and 22 minutes, respectively.

Throughout the development phase several obstacles were encountered. The first challenge was devising a way to expand TCT without adding additional resources. Departmental resources were assessed and several activities were reassigned to other roles to allow for additional dedicated validated technician positions. The integration of information technology also required months of collaboration between the operations and the pharmacy information technology teams as the system was developed.

In the coming months, further expansions to the TCT program will be explored as the program has moved from a variance process to the new pharmacy examining board pilot program. The changes to the pilot program have allowed consolidation of the cartfill and first dose programs removing duplicative training and combining the documentation and reporting requirements. Expansion into automation batches and cabinet replenishment workflow would put approximately 90% of all doses leaving central pharmacy checked by a technician. In addition, scan on delivery or pneumatic tube will also be explored allowing for full visibility of the distribution process. ●

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References
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