Evaluation of Medication Order Turn-Around Time Following Implementation of Digital Fax Technology for Prescriber Order Transmission To Pharmacy in a Tertiary Care Hospital

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Objectives

- Evaluation of total medication turn-around time before and after implementation of digital fax technology.
- Evaluation of the total medication turn-around time for the first dose of antibiotics.

Study Context

Reducing medication turn-around time can be directly associated with:

- Improved patient safety
- Improved quality of care
- Enhanced workflow efficiency
- Reduced healthcare costs

This study is a retrospective, objectivist-based approach evaluation to assess the impact of digital fax technology on medication turn-around time.

Digital fax technology software creates a digital image of a scanned/faxed Prescriber Order which is stored within a computer queue accessible for review and processing in the pharmacy information system. Traditional systems of Prescriber Order transmission to the pharmacy required faxing priority orders to create a paper copy or delivery of a carbon-copy via porter service.

Settings

Medication orders were analyzed for inpatients admitted to 3 Capital Health sites: Victoria General Hospital, Halifax Infirmary Hospital and Dartmouth General Hospital.

Methods

• Data were collected from Centricity® Pharmacy, pharmacy information system and Horizon Patient Folder™ (HPF), digital health record, and were audited by two reviewers.

• Inclusion criteria:

- Patients admitted to audit site who were discharged prior to the audit.
- Medication orders composed during the specified audit periods: June 6-10, 2011 (Period 1) and September 26-30, 2011 (Period 2).
- Medication orders where the order was verified by the pharmacy and the medication was administered to the patient on the same day.
- Medication orders for a new medication, an increase in dose, frequency or a changed route for a previously ordered medication.
- Medication orders signed by an authorized prescriber with a date and time of composition.
- For medication order sets, the first medication will be included.

•Exclusion criteria:

- Orders composed during weekends or when the pharmacy is closed.
- As needed orders (PRN).
- Self administered orders (SELF).
- Patient's own medication (POM).
- Emergency department or pre-admission orders.
- Total Parenteral Nutrition (TPN) or chemotherapy orders.

Analysis

- **Estimated turn-around time prior to implementation was 4 hours.**
- **Estimated decrease in turn-around time post implementation was 25% (3 hours, standard deviation of 225 minutes).**
- **Sample size: 296 orders in each audit period (to achieve a two-tailed α of <0.05 with 90% power).**
- **Data were analyzed as medians (inter-quartile range) and differences between periods were tested with the Mann-Whitney U test for significance of two phases of turn-around time:**
  - Total turn-around time (time from order composition to administration of medication).
  - Phase I turn-around time (time from order composition to pharmacy verification).
- **Medications were analyzed in three groups:**
  - All Medications
  - Antibiotics
  - Non-antibiotics

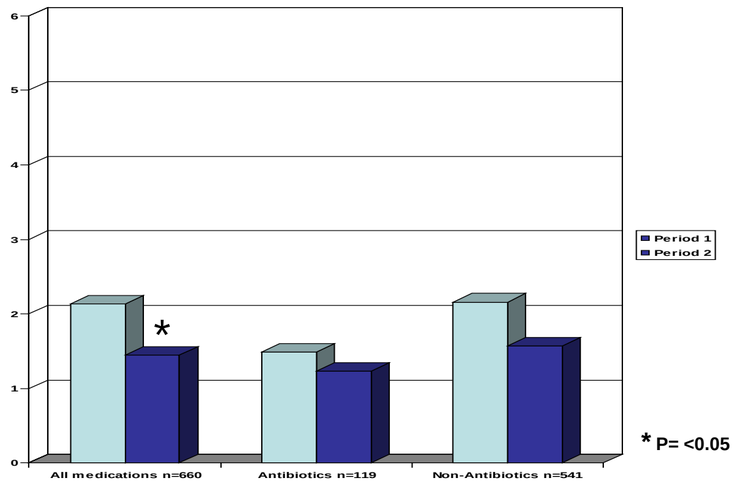
Results

Number of orders screened to achieve sample size

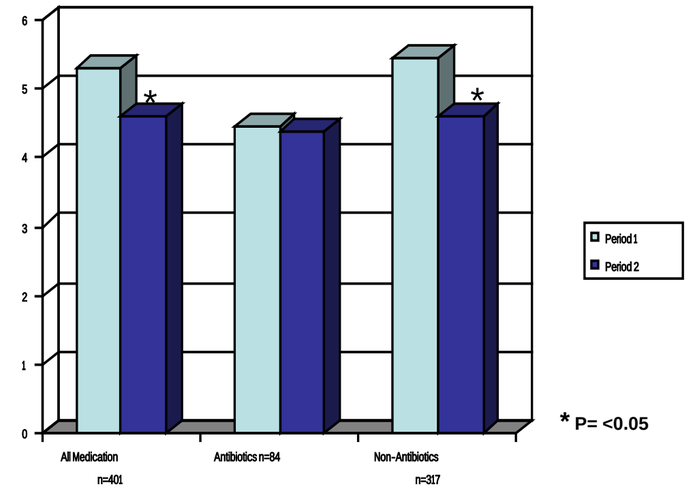
	Screened	*Eligible*
Period 1	2766	356
Period 2	1702	304

Excluded data:

- Lack of composition time (36% in Period 1 and 75% in Period 2)
- Medication order set (14% in Period 1 and 2)
- Orders composed on a different day than pharmacy verification (10% in Period 1 and 3% in Period 2)



The difference in Phase I turnaround time in period 1 and 2 for each medication group in all sites



The difference in Total turn-around time in Period 1 and 2 for all medication groups in all sites

Type	*Phase I turn-around time*		*Total turn-around time*	
	% time reduction	*P-value*	*% time reduction*	*P-Value*
All Medication	21%	0.03	9%	0.04
Antibiotics	24%	0.07	3%	0.69
Non-antibiotics	14%	0.19	13%	0.03

Reduction of turnaround times for each mediation category for all sites

Conclusion

The implementation of digital fax technology software decreased total turn-around time for all medications by 30 minutes and for antibiotics by 8 minutes. The change in turnaround time was mainly attributed to changes in Phase I. Improvements in turn-around time may be associated with improvements in patient safety, quality of care and reduced costs.

References

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