

# Implementation of Pharmacist-Initiated Orders: “Pharmacist Suggests”

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## INTRODUCTION

The Kingston General Hospital is a 452-bed teaching hospital with 20 full-time pharmacists providing direct patient care and support services to a wide variety of medical and surgical programs. Drug distribution is accomplished through a centralized unit-dose system. Pharmacists and pharmacy technicians use the pharmacy computer system (RxTFCTM, BDM Information Systems Ltd., Saskatoon, Saskatchewan) to maintain patient medication profiles.

Pharmacists have the knowledge and skills to ensure optimal drug therapy. However, delays in implementing drug therapy may be caused by the lack of a mechanism for notifying physicians of pharmacists' recommendations. Before the implementation of “Pharmacist Suggests” orders at Kingston General Hospital, pharmacists primarily used medication memoranda (medication memos) to communicate nonurgent drug order problems and drug therapy recommendations to physicians. Drug order problems included errors, orders for nonformulary or restricted drugs, and drug alerts (e.g., drug allergy, duplication, or drug interaction). Drug therapy recommendations included recommendations to modify drug therapy or perform additional drug monitoring. The medication memos (Appendix 1) were generated from RxTFCTM in the main dispensary and placed in the physician's orders section of the patient chart as a permanent record. Physicians were required to review any medication memos and write new drug orders if needed. Approximately 700 memos were generated by pharmacists each month, for which the average resolution rate was 86%. Informal feedback from pharmacists, physicians, and nurses indicated that the recommendations in the memos were not

addressed in a consistent and timely fashion. A previous study<sup>1</sup> at the same hospital showed that the mean resolution time ( $\pm$  standard deviation) for medication memos was  $1.92 \pm 1.19$  days (range 0 to 13 days) for “clarification” discrepancies (i.e., drug name, dose, route, frequency, duplication, or allergy) and  $2.46 \pm 2.58$  days (range 0 to 15 days) for resolution of nonformulary medication issues. In attempts to have memos and drug-related problems resolved more quickly and efficiently, a decision was taken to implement “Pharmacist Suggests” orders. A “Pharmacist Suggests” order was defined as a conditional order written by a pharmacist in the patient chart according to specific order criteria. Physician cosignature was required for these orders to be processed. The purpose of this report is to describe the approval process and the institution's experience with the implementation of “Pharmacist Suggests” orders.

## PILOT STUDY

A 1-month pilot study was conducted in August 2000 to determine the potential effectiveness of “Pharmacist Suggest” orders and to identify associated issues or problems. The trial proposal was approved by the Nursing Advisory Council, the Internal Medicine Joint Practice Care Team, and the Pharmaceuticals and Therapeutics Committee in June 2000. Nursing and physician in-services took place in July 2000. The trial covered all patients admitted to a 32-bed inpatient Internal Medicine unit. Three Internal Medicine pharmacists wrote “Pharmacist Suggests” orders in the physician's orders section of the patient chart according to the following specific, predefined order criteria:

- Suggest change in dosage or discontinuation of drug because of interaction or duplicate therapy.



- Suggest change in dosage because of patient weight, organ function, or other dosing parameter.
- Suggest obtaining serum drug or chemistry levels.
- Suggest change in route and/or dosage form.
- Suggest changing nonformulary drug order to have patient either use own medication supply while in hospital or use a formulary drug alternative.
- Suggest order to change duration of or to discontinue drug therapy.

The following procedure was used for writing “Pharmacist Suggests” orders during the pilot study:

- Pharmacists in the Internal Medicine Unit reviewed medication orders daily.
- The pharmacists wrote “Pharmacist Suggests” orders according to the specific criteria outlined above. They included supporting documentation for the recommendation in the multidisciplinary progress notes if required.
- The pharmacists flagged the orders for physician countersignature.
- For any “Pharmacist Suggests” order, the physician countersigned if he or she agreed with the order. Otherwise the physician was asked to write “Disregard pharmacist suggested order”.
- The unit clerk or nurse transcribed the order onto the medication administration record.
- The order was sent to the main pharmacy for computer-order entry and medication dispensing.
- The investigators collected the pharmacy’s copy of all suggested orders for review and analysis.

The pilot results were positive. During the pilot study, 19 “Pharmacist Suggests” orders were written, for which the acceptance rate was 100%; the average review time (from time when the order was written until time of computer-order entry) was 5.4 h, based on 16 of the 19 orders (3 of the orders recommended obtaining serum drug or chemistry levels, and time was not recorded in the pharmacy computer system in these cases). In addition, there were no transcribing errors on the medication administration record. The results were presented and feedback was received from the Department of Medicine, the Internal Medicine Joint Practice Care Team, and the Pharmacy Professional Practice Team. Suggestions for hospital-wide implementation included the addition of a seventh order criterion (to continue preadmission drug therapy in hospital) and a request that pharmacists include a brief reason for changes directly below each suggested order.

## HOSPITAL-WIDE IMPLEMENTATION AND EVALUATION

### Implementation

A proposal for hospital-wide implementation of “Pharmacist Suggests” orders was approved by the Pharmaceuticals and Therapeutics Committee and the Medical Advisory Committee in late 2000. Staff communication involved an announcement in the hospital nursing bulletin, as well as pharmacist in-services and memos sent to all housestaff and attending physicians. Implementation began in February 2001 with a concurrent evaluation over 4 months. Seventeen pharmacists and one pharmacy resident (covering all inpatient areas of the hospital) participated in the implementation of “Pharmacist Suggests” orders. During this period, all “Pharmacist Suggests” orders received in the main pharmacy (including those written on evenings and weekends) were flagged for review.

### Data Collection

The following procedure was used for data collection and evaluation:

- The principal investigator (E.K.) reviewed all “Pharmacist Suggests” orders received in pharmacy.
- “Pharmacist Suggests” orders that had been cosigned by a physician and sent to the pharmacy were entered into RxTFCTM. For orders that had not been cosigned, the team pharmacist followed up with the physician to determine the reason for the order not being signed (e.g., order not flagged or physician did not agree with the order).
- The drug order-entry pharmacist or technician entered information into the computer system, including order criteria and whether the suggested order had been accepted (cosigned by physician exactly as written), disregarded, or designated “other” (e.g., accepted but modified by the physician in some way).
- Summary data for acceptance rate and order criteria were generated monthly from RxTFCTM.
- The processing time for “Pharmacist Suggests” orders (from when the order was written by the pharmacist to when the order was processed by the pharmacy) was estimated by reviewing a sample of orders collected between May 22 and 31, 2001 (excluding the weekend).



**Table 1. Disposition of “Pharmacist Suggests” Orders During 4-Month Implementation Period in 2001**

Month	Disposition; No. (and %) of Orders								Total
	Accepted		Disregarded		Other*		Unknown		
February	219	(94)	2	(1)	4	(2)	9	(4)	234
March	263	(96)	1	(<1)	2	(1)	7	(3)	273
April	229	(98)	0	(0)	0	(0)	4	(2)	233
May	202	(98)	0	(0)	1	(<1)	3	(1)	206
Total	913	(97)	3	(<1)	7	(1)	23	(2)	946

\*Not accepted as written.

**Table 2. Order Criteria for “Pharmacist Suggests” Orders**

Criterion	Month; No. (and%) of Orders					Total
	February	March	April	May		
Change dosage or discontinue drug because of interaction or duplicate therapy	6	6	7	4	23	(2)
Change dosage because of patient weight, organ function, or other dosing parameter	44	57	69	54	224	(24)
Determine serum drug or chemistry levels	10	10	15	8	43	(5)
Change route and/or dosage form	24	17	19	10	70	(7)
Nonformulary drug recommendations	40	65	30	29	164	(17)
Change duration or discontinue drug therapy	34	33	32	46	145	(15)
Continue patient’s home drug therapy in hospital	76	85	61	55	277	(29)
Total	234	273	233	206	946	(100)

- All “Pharmacist Suggests” orders were assessed by the authors for appropriateness (i.e., compliance with order criteria) and format (i.e., inclusion of order title, date, reason for change, pharmacist name, and pager number). Orders that did not meet the order criteria were set aside and were not entered into RxTFCTM or included in the analyses.

## Evaluation and Results

During the 4-month implementation period (February to May 2001), 64 761 drug orders were entered into RxTFCTM. During the same period, data from 946 “Pharmacist Suggests” orders (representing 1% of the drug orders) were recorded in RxTFCTM. In total, 913 (97%) of the 946 orders were accepted by physicians (Table 1). For 23 orders (2%) no outcome was documented; these were classified as “outcome unknown”. Possible reasons for an unknown outcome include failure to enter the outcome into RxTFCTM or discharge of the patient before an outcome was entered. Orders recorded as having an outcome of “other” (7 or 1%) were those that were neither accepted nor disregarded by the physician.

Examples of orders classified as having an outcome of “other” included those that were no longer applicable to the patient’s care (i.e., change in care plan) and those that were modified by the physician. Only 3 (<1%) orders were disregarded by physicians.

To determine order processing time, a sample of 55 “Pharmacist Suggests” orders (collected on 8 days of a 10-day period) were reviewed manually. The mean processing time was 4.6 h (median 3.2 h, range 0.03 to 18.3 h). These results were similar to those in the pilot study, which suggests that orders were being reviewed and cosigned in a timely manner.

There were 7 approved order criteria for a pharmacist to write a “Pharmacist Suggests” order. The 3 most frequent criteria used by pharmacists were continuation of a patient’s home drug therapy while in hospital (29%); adjustment of therapy because of patient’s weight, organ function, or other dosing parameter (24%); and recommendations related to nonformulary drugs (17%) (Table 2). The order criterion used least frequently was a change in drug therapy as a result of a drug interaction or duplicate therapy (2%).

Pharmacists’ compliance with the order criteria was also assessed. During the study period, 26 orders



**Table 3. "Pharmacist Suggests" Orders Not Included in Analysis**

Reason	No. of Orders
<b>Did not meet order criteria</b>	
Suggested compatible IV solution in which the drug could be diluted	1
Suggested that physician assess a specific drug or request a specialty consultation	3
Suggested change in drug administration times	2
Suggested starting new drug	5
Suggested drug according to patient preference	1
<b>Did not follow established procedure</b>	
Did not state reason for suggestion in written order	9
Suggested alternative drug therapy without specifying dose or frequency	3
Corrected physician orders	2
Total	26

that did not meet the order criteria were collected and reviewed (Table 3). Twelve (46%) of these orders were not written in accordance with the order criteria and 14 (54%) did not follow established procedures for writing "Pharmacist Suggests" orders. Although these orders were not included in the analysis of acceptance rate, it should be noted that they were all accepted by physicians.

One medication incident report was received in March for a patient on the Orthopedic Service. A "Pharmacist Suggests" order had been written to decrease the frequency of an antibiotic (cotrimoxazole) because of reduced renal function. The order was cosigned but was not transcribed until the next day. As a result, the drug therapy was not changed and the patient received an extra dose of the antibiotic at the initial dose. No adverse outcomes were noted.

The results of the evaluation of the "Pharmacist Suggests" order program were presented to the Pharmaceuticals and Therapeutics Committee in October 2001, along with a draft "Pharmacist Suggests" administrative policy (Appendix 2) and simplified order criteria. The policy was subsequently approved by the Medical Advisory Committee with a request for ongoing review of "Pharmacist Suggests" orders to ensure appropriateness and safety.

## DISCUSSION

Pharmacists' impact on patient outcomes and cost in hospital settings has been well documented.<sup>2,3</sup> Pharmacists' recommendations are also well received

by physicians. One study, conducted in a Toronto hospital, collected and analyzed 361 pharmacist interventions over a 2-week period.<sup>4</sup> The reported physician acceptance rate (96%) was similar to that reported here. Seventy-six (93%) of 82 orders were judged by physicians as having a positive effect on patient outcomes. Another study evaluated factors that influenced physician enactment of pharmacists' drug therapy recommendations in a general medicine clinic.<sup>5</sup> Pharmacists' suggestions were presented to physicians both orally and in writing. However, details of how written documentation was provided were not specified. The authors found that physicians were most likely to act upon recommendations to either stop a drug or change a dose. At Kingston General Hospital, these types of interventions accounted for 41% (392 orders) of all "Pharmacist Suggests" orders during the 4-month implementation period. The types of interventions commonly undertaken by pharmacists have also been described. One study used an online pharmacy intervention program to document and evaluate pharmacists' contributions to patient care.<sup>6</sup> Of 2499 interventions recorded, the 3 most common types of interventions were order clarification or change (18%), pharmacokinetic consult (16%), and chart review (13%). Other interventions included follow-up on restricted drugs (8%), medication screen (7%), initiation of drug therapy (6%), provision of drug information (5%), discontinuation of a drug (4%), and recommendation of a therapeutic alternative (4%). Studies assessing written documentation of pharmacist recommendations in the physician's orders section of the patient chart have not yet been published.

Since the 4-month implementation phase, pharmacists' enthusiasm for "Pharmacist Suggests" orders has increased. Memos to communicate nonurgent drug order problems are still generated in the main pharmacy by order-entry pharmacists. The difference is that the process of resolving problems identified in the memos is more efficient. Moreover, implementation of "Pharmacist Suggests" orders has enabled pharmacists to initiate drug therapy changes in a proactive manner that can be viewed and valued by all members of the health team (through its inclusion in the orders section of the patient chart).

This study had some design limitations. First, the order criteria and acceptance rate data collected were dependent on entry of this information into RxTFCM by the order-entry pharmacist or

technician without verification. It is possible that some information was missed or entered incorrectly. Second, the processing time for “Pharmacist Suggests” orders was estimated on the basis of the 55 orders collected during 8 weekdays (the weekend within this collection period was excluded because of reduced staffing on the units and in the pharmacy). Actual processing time might be different from the calculated value depending on the clinical area. For example, the processing time might be longer in surgical areas than in an Internal Medicine unit according to availability of physicians to cosign orders. Also, because this study was conducted in a teaching hospital with more staff than would be typical of a nonteaching hospital (because of the presence of residents), the generalizability of these results to nonteaching hospital settings is unknown. It is also unknown whether medical and surgical residents would be more likely than attending physicians to cosign “Pharmacist Suggests” orders. Pharmacists need to assess the urgency of their recommendations and determine when orders are most likely to be reviewed by a physician to determine if writing an order is appropriate. Finally, because the study design was noncomparative, there was no attempt to measure the effects of “Pharmacist Suggests” orders on drug therapy outcomes. Ideally, the impact of pharmacist prescribing in an acute care setting would include a measure of patient outcome (e.g., length of hospital stay, patient satisfaction) or the satisfaction of physicians and nurses.

The “Pharmacist Suggests” orders initiative demonstrates a collaborative level of prescribing as defined in the Canadian Society of Hospital Pharmacists statement on pharmacist prescribing.<sup>7</sup> This model requires a cooperative practice relationship between the physician (or other health care professional with legal authority to prescribe medications) and the pharmacist.<sup>7</sup> According to the CSHP statement, the role of the pharmacist at this level of prescribing is to select, initiate, monitor, modify, continue, and discontinue pharmacotherapy “as appropriate to achieve the desired patient outcomes”. The “Pharmacist Suggests” order criteria allow pharmacists to perform all of the above interventions except initiation of new drug therapy. At the time of protocol development for “Pharmacist Suggests” orders, pharmacists were encouraged to discuss initiation of new drug therapy with the physician team. Further development of “Pharmacist

Suggests” orders may include recommending initiation of new drug therapy for both inpatients and outpatients.

## CONCLUSIONS

“Pharmacist Suggests” orders resulted in better communication of pharmacist recommendations to the health care team, as evidenced by a reduction in average review time and an increase in awareness of pharmacists’ roles. These orders also provided pharmacists with a method of documenting patient-specific clinical interventions in the patient chart. It is hoped that the results of this study will encourage and assist other hospital pharmacists to expand their roles and improve patient care through implementation of a “pharmacist suggests” protocol.

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## Appendix 2. Administrative Policy for “Pharmacists Suggests” Orders

### KINGSTON GENERAL HOSPITAL ADMINISTRATIVE POLICY MANUAL

Subject: “Pharmacist Suggests” Orders  
Prepared/Reviewed by: Pharmaceuticals & Therapeutics, Joint MAC  
Issued by: President & Chief Executive Officer  
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#### Definition

A “Pharmacist Suggests” order is a conditional order written by a pharmacist in the patient chart. Physician approval is required for the order to be processed.

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#### Purpose

To provide an efficient and accurate method of modifying inpatient drug therapy based on pharmacists’ recommendations.

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#### Procedure

1. Pharmacist:
  - A) Identifies a drug-related issue that can be resolved by one or more of the following changes to an existing medication order:
    - Dose change
    - Dosage form or drug vehicle change
    - Route of administration change
    - Dosage schedule (i.e., time or frequency of administration) change
    - Duration of therapy change
    - Discontinue therapy
  - B) Initiates new drug therapy as
    - an alternative to a nonformulary medication
    - continuation of preadmission drug therapy in hospital
  - C) Orders serum or chemistry levels

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2. Writes “Pharmacist Suggests” order in the patient chart including:
  - 2.1 Title “Pharmacist Suggests”
  - 2.2 Date and time order is written
  - 2.3 Recommendation (including drug name, strength, dosage form, route and frequency)
  - 2.4 Brief reason for order change (or refer to explanation in Interdisciplinary Progress Note)
  - 2.5 Signature and pager number
  - 2.6 Blank for physician counter-signature

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3. Flags the order on the patient chart for physician counter-signature.

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4. Follows up with physician on suggested orders that are not accepted.

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#### Physician:

5. Reviews suggested order.
  - 5.1 If suggestion is accepted, counter-signs order beside pharmacist’s signature and flags chart for order to be processed.
  - 5.2 If suggestion is not accepted, writes “disregard pharmacist suggests order” below suggested order and signs.

Cross-reference: KGH Administrative Policy #11-40: Medical Orders

