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PILOTING A RENAL DRUG ALERT SYSTEM FOR PRESCRIBING TO RESIDENTS IN LONG-TERM CARE

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To the Editor

Approximately 40% of long-term care (LTC) residents have some degree of renal impairment,¹ and 42% have received at least one prescription that was inappropriate because of their renal function.²

To assist LTC physicians with the challenge of prescribing to older adults with renal impairment, a computerized clinical decision support system (CDSS) was developed in partnership with a large pharmacy provider that generated renal prescribing alerts. Because of several barriers, including considerable personnel and acquisition costs to develop and implement the CDSS and limited information technology infrastructure, it has not been widely adopted in the LTC setting.³ It has been successfully implemented and tested in two academic LTC homes, but site-specific adaptation and substantial personnel commitment were needed.^{3,4} The role of the consultant pharmacist was seen as essential for implementation of CDSS.³ The results of a pilot evaluation in seven LTC homes across Ontario, Canada, are presented below.

Based on a literature review and consulting well-known sources,^{5,6} an expert panel (including five specialists in geriatrics, nephrology, and academic and consultant pharmacists) provided recommendations for 25 medications that had good evidence for renal dose adjustments. Final recommendations were programmed into the central prescription database of the pharmacy provider.

Figure 1 provides an operational flowchart of the CDSS. If a resident's creatinine clearance (CrCl) was below the identified threshold for a medication, a prescribing alert was automatically printed. Acting as the gatekeeper, the consultant pharmacist prescreened alerts for relevance (i.e., in some cases, the dose or drug was already appropriate) and added additional information based on chart review where applicable. Relevant alerts were given to the physician along with any additional advice. All standing prescriptions at baseline and any new orders over the following 3 months were checked on the CDSS.

The total number of beds in the seven LTC homes was 1,196. The homes ranged in size from 10 to 370 beds (mean 171, median 144). During the 3-month program evaluation, 446 alerts were generated in 321 residents. The mean age of residents receiving an alert was 87.0 ± 7.4 , and 81% were female. Mean CrCl was 34.6 ± 12.3 . Twenty-seven percent of all residents received at least one alert. After prescreening, consultant pharmacists sent 63% ($n = 282$) of the alerts to the physician. Physicians responded to 70% of these alerts with a dose change or medication discontinuation. The most common medications with an alert were digoxin, ranitidine, and metformin, accounting for approximately 45% of all alerts generated.

In a telephone survey with five family physicians participating in the pilot project, all believed that recommendations were appropriate and clear. All had confidence in the alerts, and four rated the alerts as very helpful and one as somewhat helpful. The physicians cited their relationship with the consultant pharmacist and confidence in the expert panel as positive factors. Other factors that increased physicians' confidence with alerts were the specific recommendations provided and that the expert panel who developed the alerts were local and national opinion leaders.

The high rate of physician response is contrary to other studies that have found that physicians ignore messages that are too frequent or deemed irrelevant or unnecessary.⁷⁻⁹ When excessive numbers of prescribing alerts are produced, clinicians often ignore them because of "alert fatigue." It was hypothesized that the pharmacist-mediated system streamlined the process and contributed to the high rate of physician response. The consultation with LTC physicians during the development phase maximized the relevance and user-friendliness of the alerts.

This program overcame many cost-related and logistical barriers faced by LTC homes in implementing a CDSS.^{3,4,10} Initiating this project at the central pharmacy level enabled LTC homes to participate without implementing any additional infrastructure. Consultant pharmacists provided the extra support necessary, which is aligned with their role in LTC.

In the future, even as LTC homes have greater access to computerized physician order entry, involving consultant pharmacists will be a valuable part of increasing the uptake of recommended prescribing practices.

Further evaluation is required to determine whether this alert system reduces the number of adverse events, but this pilot project demonstrated that a pharmacist-mediated CDSS had a high rate of acceptance by LTC physicians. The pharmacy provider has implemented the CDSS across LTC homes in Ontario, Canada.

As LTC homes increasingly adopt electronic technologies, more-widespread use of CDSS to support appropriate prescribing is a realistic and perhaps necessary goal. Further studies are needed to examine the potential gains in patient safety and cost-savings associated with CDSS use in LTC.

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Figure 1.

Flowchart for renal prescribing computerized clinical decision support system (CDSS). *At baseline, all current prescriptions were reviewed once, and after that only new prescription orders were reviewed. †An alert is generated if creatinine clearance is below the appropriate threshold for that medication.