Innovations in Family Medicine Education

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Demonstrating Prescribing Competence: A Successful Pilot of a Prescription Competency Curriculum for Family Medicine Residents

Regina Ginzburg, PharmD; Andreas Cohrssen, MD

Background: Poor medication prescribing skills among residents have been widely reported. Methods: We implemented a three-stage prescribing curriculum with eight interns in an urban family medicine residency. Clinical pharmacy faculty delivered two lectures, attended hospital rounds, and co-precepted in clinic. Evaluations were done by a written exam and clinical assessment. Results: All eight interns made at least one prescribing error on the exam. One error was considered potentially fatal. All interns passed on the second attempt and gained prescribing privileges after 6 months. Conclusions: Our prescribing curriculum was practical and feasible. Further studies will determine whether the intervention improved prescribing habits and reduced clinical errors.

Medication errors are estimated to cost $37 billion and result in 7,000 annual deaths, with a majority of these errors due to improper dosing, wrong drug, or wrong duration. However, in most medical schools, pharmacology training is limited to the basic science years, leaving medical graduates to acquire prescribing proficiency through clinical experience within their residency program. Lack of prescribing skills among residents has been widely reported. Granting these new doctors prescribing privileges without adequate assessment may encourage poor prescribing habits and promote medication errors.

In an effort to assess and reduce potential prescribing errors by our new residents, the Beth Israel Family Medicine Residency Program implemented a prescription competency curriculum for incoming first-year residents (postgraduate year one [PGY-1]). Our goals were to help residents translate pharmacology knowledge into safe prescribing habits and to develop measures to demonstrate readiness for independent prescribing.

Methods
Subjects and Settings
The Beth Israel Residency in Urban Family Practice has eight residents per year. The curriculum was first implemented in the fall of 2003. Our study subjects are eight interns from one academic class between 2003 and 2006. To preserve anonymity, the specific year is not stated. Beth Israel and the Institute for Family Health Institutional
Review Boards awarded the study exempt status.

**Curriculum Description**

We did not allow our interns independent prescribing privileges until they had successfully completed our prescribing curriculum. The curriculum consisted of three stages:

**Stage 1: Orientation Lecture, 1 Week Before Commencing Residency**

The inpatient and outpatient clinical pharmacy faculty members outlined the prescription competency curriculum and shared brief tips on appropriate ordering and prescribing.17

**Stage 2: Preparation for Competency Assessment, First 3 Months of Residency**

We supplied the interns with access to electronic and tertiary resources within the hospital and clinic. They were instructed to use these resources to appropriately write prescriptions for their patients and have medical faculty review and co-sign the prescription. The inpatient pharmacy faculty consistently rounded with housestaff and assisted in writing appropriate orders, while an outpatient pharmacy faculty precepted and assisted with prescribing.

During the third PGY-I block, we delivered a 1-hour lecture on appropriate prescription writing. We derived the lecture content from the literature18–21 and faculty expertise.

**Stage 3: Prescription Competency Assessment, End of Block 3**

Our assessment was comprised of a written prescription competency exam and a clinical evaluation. The written exam consisted of four typical case scenarios encountered in clinic requiring the intern to prescribe specific medications. Prescriptions had to be compliant with state law and include all appropriate information needed. We also included five true/false questions and 10 matching for brand/generic names. Interns were allowed to use any resource available to them but were required to work individually. There were no time constraints to the exam. Any error that may have rendered potential harm or could not be dispensed by a pharmacist resulted in failure. Examples of such errors included lack of state-required information needed for narcotic prescribing, writing for a nonexistent dosage form, or inappropriate dosing. The pharmacy faculty reviewed the exam with interns who failed and gave a make-up exam 2–3 weeks later. As a performance comparison, nine physician faculty members also took the exam.

In addition to the written exam, interns underwent a clinical prescription competency evaluation. Faculty clinicians judged the interns’ ability to correctly write prescriptions either in the hospital or clinic setting. The intern needed to have prescribed three or more medications for a particular patient to receive an evaluation. A prescription competency evaluation form17 was available for faculty to complete. Three satisfactory evaluations were needed for the intern to pass this section.

**Results**

Eight out of eight interns (100%) demonstrated at least one prescribing error on the written exam. A majority of the errors were related to state requirements for controlled substances and underdosing iron for a pediatric patient (see Table 1). One prescription (pediatric iron overdose) may have constituted a fatal error.

Five out of nine (56%) participating physician faculty members demonstrated at least one error within the case scenarios (Table 1). Faculty made twice as many errors on the true/false questions as interns (six versus three errors). No fatal errors were detected.

Errors were reviewed privately with each intern and faculty participant, and education on appropriate prescription writing was given. All interns took the make-up exam and subsequently passed.

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**Table 1**

<table>
<thead>
<tr>
<th>Type of Errors in Prescription Competency Exam</th>
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</thead>
<tbody>
<tr>
<td><strong>Error Type</strong></td>
</tr>
<tr>
<td>Controlled substance</td>
</tr>
<tr>
<td>Missing required information on Rx (as per NYS law)</td>
</tr>
<tr>
<td>Wrong/missing # given when asked for “maximum # of tablets” (as per NYS law)</td>
</tr>
<tr>
<td>Inappropriate directions</td>
</tr>
<tr>
<td>Not written on official NYS Rx</td>
</tr>
<tr>
<td>Pediatric dosing (iron)</td>
</tr>
<tr>
<td>Overdose</td>
</tr>
<tr>
<td>Underdose</td>
</tr>
<tr>
<td>Strength not available</td>
</tr>
<tr>
<td>Insulin case</td>
</tr>
<tr>
<td>Inappropriate medication dosage and/or directions</td>
</tr>
<tr>
<td>True/false questions</td>
</tr>
<tr>
<td>Matching (brand-generic names)</td>
</tr>
</tbody>
</table>

NYS—New York State
All interns received satisfactory clinical evaluations within 1–3 months after the assessment began.

Discussion

All PGY-I residents made at least one prescribing error on our exam. However, all subsequently passed and received prescription privileges by the second half of their intern year. The delay in prescribing privileges did not pose a significant problem to our workflow, since prescribing was done via our electronic medical record. Our computer system is set up to allow interns to enter prescriptions but will not print them without authorization from an attending physician, which was done during precepting.

On the written exam, faculty made more errors than interns on insulin dosing and true/false questions (Table 1). Faculty tended to initiate insulin at lower than recommended doses, based on their clinical experience and concern for hypoglycemia. Interns tended to be more adherent to published guidelines and recommendations when initiating insulin therapy. It is unclear if this difference would result in clinically significant outcome differences. In answering true/false questions, faculty, while allowed to use resources to answer the questions, most often used clinical experience, whereas interns relied more on references.

Our pilot study is limited to one class of interns in one residency program. While our interns demonstrated improved prescribing skills, we do not yet know if this translates into improved prescribing behavior and a reduction in prescribing errors. Finally, not all family medicine residencies have access to pharmacy faculty, so resource allocation is an important consideration in generalizing these findings.

There is a clear need for a medication-prescribing curriculum for family medicine residents, and our curriculum proved practical and feasible. Future studies should address whether a structured prescribing curriculum such as ours results in improved prescribing behaviors in real clinical settings and an associated reduction in prescribing errors.

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References