CASE STUDY

Academic Detailing Has a Positive Effect on Prescribing and Decreasing Prescription Drug Costs: A Health Plan’s Perspective

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BACKGROUND: When initiated by a health plan, academic detailing can be used to change prescribing practices, which can lead to increased safety and savings.

OBJECTIVE: To evaluate the impact of academic detailing on prescribing and prescription drug costs of cefixime to a health plan.

METHODS: A prospective intervention study was carried out that evaluated the prescribing practices and prescription drug costs of cefixime. A total of 11 prescribers were detailed by 1 pharmacist between August 2014 and March 2015. Two of the 11 prescribers did not respond to the academic detailing and were not followed up. The physicians’ prescribing habits and prescription costs were compared before and after detailing to evaluate the effectiveness of the intervention. Data were collected for approximately 5 months before and after the intervention. Each prescriber served as his or her own control.

RESULTS: Overall, an approximate 36% reduction in the number of cefixime prescriptions written and an approximate 20% decrease in prescription costs was seen with academic detailing compared with the year before the intervention. In 9 of 11 (82%) prescribers, intervention with academic detailing was successful and resulted in fewer prescriptions for cefixime during the study period.

CONCLUSION: Academic detailing had a positive impact on prescribing, by decreasing the number of cefixime prescriptions and lowering the drug costs to the health plan.

KEY WORDS: academic detailing, antibiotics, cefixime, prescribing, prescription drug costs

A
cademic detailing involves trained pharmacists who have thorough medication knowledge and who meet with prescribers to discuss the best prescribing practices. According to the National Resource Center for Academic Detailing, academic detailing is an effective way of communicating accurate, up-to-date information about comparative effectiveness, safety, and costs of a treatment. It is a method of outreach education that provides the one-on-one communication approach of industry detailers, without the commercial influence. This method has been used in different states and for varied purposes, such as drug class education (Idaho), disease state management education (New York), immunization promotion (Texas), and appropriate prescribing in the elderly (Pennsylvania). The goal of this study was to use academic detailing to reduce the inappropriate prescribing of cefixime and the associated cost.

We conducted this study at Community Health Choice, Inc, which is a local nonprofit HMO plan that offers the Medicaid State of Texas Access Reform program, the Children’s Health Insurance Program, and Health Insurance Marketplace Plans, with a network of 10,000 doctors and 70 hospitals.

Overprescribing antibiotics is deemed inappropriate, because the risk for drug resistance is increased with the use of broad-spectrum antibiotics. Drug resistance happens when new strains of bacteria emerge, making it more difficult and more expensive to treat common infections, which can become life-threatening. When treating bacterial infections, it is important for physicians to give an adequate trial of antibiotics that are considered first-line therapy, which helps to keep patients and health plan costs down and decreases the time needed to treat the infection.

Cefixime is a broad-spectrum, bactericidal third-gen-
eradication of the bacterium. A cephalosporin that works by inhibiting bacterial cell-wall synthesis by binding to 1 of the penicillin-binding proteins. Although cefixime is effective in treating community-acquired pneumonia (CAP), acute bacterial sinusitis, otitis media, pharyngitis, and urinary tract infections (UTIs), it is not the drug of choice for initial therapy. When treating CAP, the role of antibiotic therapy is debated, because of the increasing prevalence of viral and bacterial coinfections. The appropriate first-line antibiotic therapy for CAP is amoxicillin. Alternative treatments for CAP include second- or third-generation cephalosporins, including cefpodoxime, ceftmoxime, and cefprozil. Cefixime should only be used when prescribers are certain that the causative microbial agent is *Haemophilus influenzae*.

In the treatment of acute bacterial sinusitis, amoxicillin-clavulanate is the first-line treatment option. If the initial treatment fails, prescribers can initiate a round of doxycycline as a second-line option. Cefixime becomes a treatment option in children only when added to clindamycin after 2 previous treatment failures. In patients with penicillin allergies, levofloxacin and clindamycin with cefixime are treatment options.

When treating otitis media, the first-line antibiotic choice should be amoxicillin or amoxicillin-clavulanate if amoxicillin has been used in the previous 30 days. Cefixime may be used in combination with clindamycin as a third-line option if the initial antibiotic treatment has failed. Patients with penicillin allergies may receive cefdinir, cefuroxime, cepodoxime, or ceftriaxone as first-line therapy.

The first-line antimicrobial option for the treatment of pharyngitis is oral penicillin V or amoxicillin. For individuals with penicillin allergies, cephalaxin and cefadroxil, clindamycin, azithromycin, or clarithromycin can be used as first-line treatment options. Cefixime is appropriate to treat pharyngitis when *Streptococcus pyogenes* is the causative pathogen.

When treating UTIs in children, amoxicillin has traditionally been the initial therapy of choice; however, increased resistance of *Escherichia coli* to amoxicillin has made it a less acceptable choice. Higher cure rates have been associated with trimethoprim/sulfamethoxazole. Other appropriate treatment options for UTIs in children include amoxicillin-clavulanate, cefixime, cepodoxime, cephalaxin, or cefprozil.

### Table: Average Costs of Drug Therapy for Select Infections

<table>
<thead>
<tr>
<th>Infection</th>
<th>First-line therapy</th>
<th>Second-line therapy</th>
<th>Third-line therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community-acquired pneumonia</td>
<td>Amoxicillin 90 mg/kg</td>
<td>Cefuroxime 30 mg/kg</td>
<td>Cefixime 8 mg/kg</td>
</tr>
<tr>
<td></td>
<td>$39.24</td>
<td>$233.22</td>
<td>$619.52</td>
</tr>
<tr>
<td>Acute bacterial sinusitis</td>
<td>Amoxicillin 90 mg/kg</td>
<td>Amoxicillin/clavulanic acid 90 mg/kg</td>
<td>Cefixime 30-40 mg/kg + 8 mg/kg</td>
</tr>
<tr>
<td></td>
<td>$58.86</td>
<td>$260.74</td>
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</tr>
<tr>
<td>Otitis media</td>
<td>Amoxicillin 90 mg/kg</td>
<td>Cefdinir 14 mg/kg</td>
<td>Clindamycin + Cefixime 30-40 mg/kg</td>
</tr>
<tr>
<td></td>
<td>$29.43</td>
<td>$157.55</td>
<td>$806.39 + $619.52</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin/clavulanic acid 90 mg/kg</td>
<td>Cefixime 30-40 mg/kg + 8 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$130.37</td>
<td>$434.21 + $309.76</td>
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</tr>
<tr>
<td>Pharyngitis</td>
<td>Amoxicillin 50 mg/kg</td>
<td>Cephalaxin 20 mg/kg</td>
<td>Azithromycin 12 mg/kg</td>
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<td></td>
<td>$29.43</td>
<td>$37.80</td>
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<td>Penicillin 500 mg</td>
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<td>Urinary tract infection</td>
<td>Sulfamethoxazole/ trimethoprim 8-10 mg/kg</td>
<td>Amoxicillin/clavulanic acid 25-45 mg/kg</td>
<td>Cefixime 8 mg/kg</td>
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<tr>
<td></td>
<td>$199.23</td>
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<td>$619.52</td>
</tr>
</tbody>
</table>

*The antibiotics are dosed based on weight, and the costs reflect the weight of a 35-kg child. Source: RED BOOK Online. Micromedex 2.0, Greenwood Village, CO: Truven Health Analytics.*

### Case Study

The Director of Pharmacy Analytics at Community Health Choice identified and detailed the top physicians who prescribed cefixime to treat common pediatric infections by using claims data provided by the health plan. The purpose of the study was to ensure that physicians are prescribing appropriate antimicrobials based on the most recent pediatric guidelines. Utilizing only 1 pharmacist (the Director of Pharmacy Analytics) to conduct the detailing allowed for consistency and uniformity throughout the study. Preparation for the detailing included the pharmacist reviewing all pertinent guidelines, drug information, and prescribing patterns.

The pharmacist did not receive any formal training before performing the intervention; however, she does have more than 20 years of experience in pharmacy, a master’s degree in business administration, as well as a doctor of pharmacy degree. All prescribers were approached with the same information and methods to allow for uniform outcomes. The interventions took place between August 2014 and March 2015.

The pharmacist met with each prescriber in a one-on-one office-based meeting to execute the intervention. The physicians were provided with individualized prescribing patterns and compared them with other pediatricians. The pharmacist also provided copies of all American Academy of Pediatrics practice guidelines for the treatment of the most common childhood infections. The main goal for providing the practice guide-
lines was to ensure that prescribers would begin to utilize first-line antimicrobial therapies rather than broad-spectrum antimicrobials for initial therapy. The prescribers received a summary of all guidelines in a single chart and published an article for the Community Health Choice provider newsletter.

By having a discussion with the prescribers about why they chose cefixime as the initial therapy, the pharmacist found that the general consensus was that cefixime presented less gastrointestinal (GI) upset and diarrhea than the appropriate first-line therapy recommended by the practice guidelines. The pharmacist suggested to the physicians to counsel parents and patients about the possibility of GI upset and to ensure them that taking the antibiotic with food can help alleviate the potential for GI upset. For parents who are uncomfortable with the possibility of diarrhea, the physician should explain the potential for antibiotic resistance to first-line antibiotics.

In 2015, the number of cefixime prescriptions at Community Health Choice totaled 4906, which is a significant decrease of approximately 36% from 7708 prescriptions in 2014. The total cost to the health plan was $1.85 million spent in 2015, which was a significant decrease of approximately 20% compared with $2.3 million spent in 2014 (Figure 1).

Figure 2 shows the total number of cefixime prescriptions each physician prescribed 5 months before and after the intervention took place. Figure 2 also demonstrates the impact of the intervention on a larger scale, by looking at the total number of prescriptions prescribed. In 9 of 11 (82%) prescribers, the intervention was successful and resulted in fewer cefixime prescriptions.

However, prescribers B and G did not have the same outcomes as the other prescribers; the number of cefixime prescriptions prescribed actually increased after the intervention for these 2 physicians. The reason for the increase in cefixime prescriptions is unknown, because no additional follow-up was done with the 2 physicians.

Overall, 5 months before the intervention, the amount of cefixime prescriptions totaled 795; 5 months after the intervention, the number of cefixime prescriptions totaled 383, amounting to a decrease of approximately 52%.

Discussion

The total cost of cefixime for 2015 was $1.85 million. The estimated cost-savings to the health plan totaled $500,000, which is an estimated 38% decrease in the total number of prescriptions and an estimated 22% decrease in total cost to the health plan when comparing the 2014 to 2015 data.

The time the pharmacist devoted to this research project included the time to review the literature, evaluate and prepare presentations, write an article for the Community Health Choice newsletter, and visit with the top 11 prescribers. Two prescribers did not respond to the academic detailing, and we were unsuccessful in our attempts to follow up with them.

The total time spent on the project was 50 hours, which translates to a cost-savings of $10,000 per 1 hour spent; this amount does not include the cost-savings from the reduction in antibiotic resistance. The Centers for Disease Control and Prevention has estimated that antibiotic resistance results in an excess of direct healthcare costs of $20 billion, with additional societal costs as high as $35 billion annually for lost productivity.17
Limitations

The major limitation of this case study is that it solely addresses drug spending and did not capture outcomes, because most of the initial prescribing was deemed inappropriate. We could not review the patients’ outcomes, because it was not possible to determine which patients might have been prescribed cefixime without the academic detailing. It is difficult to ascertain if there were any treatment failures or an increase in complaints of side effects because of the decreased use of cefixime, which is a third-line antibiotic.

Conclusion

This case study evaluated the impact of academic detailing on prescribing and prescription drug costs of cefixime at Community Health Choice. Physician prescribing patterns indicated inappropriate prescribing of cefixime for common pediatric infections. Claims data provided by the health plan indicated that the intervention had a positive impact on prescribers, by decreasing the costs to the health plan through reduction of the number of cefixime prescriptions.

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Author Disclosure Statement

Dr Ndefo, Dr Norman, and Dr Henry reported no conflicts of interest.

References

evolved into a prominent construct that, as Ndefo and colleagues concluded in their article, has been shown to enhance economic and clinical health outcomes and to result in quality-of-life improvements.

**PROVIDERS/PHARMACISTS:** The individuals who have provided academic detailing include pharmacists and physicians in numerous international efforts. These efforts have been directed toward general health outcomes, as well as specific disease states that are in need of enhanced medication prescribing and patient use.

Drug information centers have played an important role in informing proper drug utilization in many sites. Amundstuen Reppe and colleagues have suggested that drug information centers play a very crucial role in providing proper counterbalanced drug information regarding appropriate medication use. A team of Brazilian researchers has examined and reviewed worldwide experiences and publications dealing with academic detailing. The findings of this Brazilian group have led the investigators to conclude that academic detailing used to enhance proper health outcomes is very worthwhile and will lead to further Brazilian efforts in this regard.

Pharmacists have been integrated into primary care practice segments in the state of Vermont. Kennedy and colleagues found that within 5 primary care practices in Vermont, the inclusion of pharmacists for 1 day a week identified numerous drug therapy problems through direct patient care approaches, population-based strategies, and education. Pharmacist-recommended strategies were accepted by physicians in 85% of the cases. A cost avoidance model analysis determined that for every $1 spent for pharmacy services, a total cost of $2.11 was avoided.

In an Australian study, Collier and colleagues found that academic detailing by a respiratory physician had widespread general practitioner acceptability and feasibility. The result of this study will lead to further academic detailing efforts and research by physicians for educational efforts of fellow respiratory physicians. In Croatia, working on the premise that appropriate utilization of evidence-based medicine was inadequate in the general practitioner community, Vrdoljak and colleagues developed a research study using medical students as academic detailers. In this study, knowledge and attitude toward the proper use of evidence-based medicine was significantly different in the study group utilizing medical students as academic detailers compared with a group of physicians without the medical student–led academic detailing.

**PAYERS:** Specific disease states have also been the focus of studies examining the potential benefits of academic detailing. In Ontario, Canada, Desveaux and colleagues used academic detailing to enhance lower antipsychotic medication utilization and enhanced outcomes in long-term care facilities. The findings from this disease-specific 6-month study within a special sub-population found that multifaceted educational outreach (eg, academic detailing) achieved a 12% to 20% reduction in antipsychotic prescribing levels in nursing homes. In an examination of the care of patients with diabetes mellitus, Fischer proposed academic detailing to primary care physicians to enhance their awareness of the importance of diabetes screening and the need for appropriate diabetes pharmacotherapy and enhanced monitoring of patient outcomes. Fischer noted that providing primary care physicians with direct engagement through academic detailing, helping them to assess needed practice changes, and providing them with specific tools to help care for patients with diabetes will improve subsequent patient outcomes.

How the US healthcare system will be structured in the future is uncertain at this time. Health insurance options and subsequent payment for healthcare in the present, short-term, and long-term are unclear; however, there will always be a tremendous need for improving processes related to the delivery of healthcare services. Academic detailing and future innovative applications of the construct will be a means to provide a much more enhanced series of benefits for the provision of healthcare for many, including providers, payers, and patients.

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