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Author’s Guidelines
n uncompromising gaze accompanied by a lascivious yet pensive manner are the hallmarks of Wilhelm Leibl's Portrait of Frau Rieder, the Apothecary's Wife. With an angular pose and an imposing look of expectancy, Leibl captures the piercing posture of this fashionable and elegant woman. The painting emphasizes Leibl's strong foothold in 19th century Realism.

Leibl's credibility as an artist is evident in his pivotal role within the Leibl-Kreis (Leibl circle). The circle consisted of talented artists from Germany and Austria who preferred freedom of expression over the mandates prevalent in academic institutions. Leibl's intense willpower made him the chosen leader of the group, which included Johann Sperl, Rudolf Hirth du Frênes, and Karl Haider. Though this exclusive club did not last long (1871–1873), Leibl benefited greatly from the artistic association and remained appreciative of the friendships it fostered.

Leibl's commitment to detail can be recognized in Frau Rieder's haute couture. The pale coat is stylishly accented with a black collar and gold pin. The black hat is placed at a dashing, jaunty angle, suggesting Frau Rieder's sophistication. In capturing the wispy hair that innocently disappears into the background, Leibl literally brushed in Frau Rieder's ambiguity.

Wilhelm Leibl was born in 1844 in Cologne, Germany. Twenty years later, he went to Munich to study at the Academy of Art. After a period in Paris, he returned to Munich, where he became overwhelmed with artistic demands that drove him to seek a quieter lifestyle. Leibl's life and his art flourished thereafter in the privacy and simplicity of Bavarian villages. His later paintings recorded the uncomplicated life he loved rather than the historical style he was taught in Munich.

In 1870, one of his paintings won a gold medal; however, it was not until the 1890s that he became viewed as the leading German Realist. During the 1870s Leibl's art demonstrated a strong attachment to the German Renaissance; later, his works appear to have been influenced by French Impressionism.

Although Leibl never considered himself an expert at female portraits, our cover art contradicts his opinion. Leibl died in 1900. Although we are a century away from his lifetime, there remains much to appreciate in his art.

Celeste d'Elliott, JMCP Contributing Editor

Sources
Oregon State University Partners with Medicaid and a Managed Care Organization

The Oregon State University College of Pharmacy has contracted to provide faculty expertise to support the pharmacy programs of the Oregon Medicaid Program and a Medicaid managed care organization, CareOregon. These relationships help advance the service mission of the college by promoting safe, efficacious, and cost-effective pharmacotherapy in Oregon. The activities funded under the agreements also offer opportunities for research and student education, promoting the college’s educational mission.

Background

In 1995, the traditional fee-for-service state Medicaid program was transformed into the Oregon Health Plan (OHP). The OHP was designed to increase the covered population while controlling costs, primarily by using a prioritized list of diagnosis and treatment pairs. Coverage was initially limited to diagnoses above a certain cut-off line that depended on enrollment and funding. However, the Health Care Financing Administration (HCFA) limited this flexibility by disallowing further movement of the line in response to funding shortfalls. HCFA also requires most patients to enroll in a managed care plan and OHP mandates managed care enrollment when possible. For patients enrolled, the plan manages the pharmacy benefit. The exception is mental health drugs, which are covered entirely by fee-for-service Medicaid.

Shortly after the OHP began, about 85% of Medicaid clients were enrolled in managed care plans. This number has since decreased to about 70% as commercial plans have withdrawn from the OHP. Currently, about 125,000 Medicaid patients are covered for drugs in fee-for-service.

CareOregon is a managed care plan in the OHP that primarily serves Medicaid recipients. Its providers and clinics are community health centers, clinics based at the Oregon Health Science University, and independent physician groups. Currently, CareOregon serves approximately 60,000 members and is expected to reach 100,000 by July 2001, as patients transfer from commercial plans leaving the OHP.

Medicaid Program Activities

In 1994, the college entered into a contract with the state Office of Medical Assistance Programs (OMAP), the agency that administers the OHP. The contract has benefited both parties and has expanded over the years to currently fund approximately six full-time-equivalent (FTE) clinical pharmacists whose responsibilities are (1) administrative support of the Oregon Drug Use Review (DUR) Board, (2) drug policy analysis and consultation, (3) educating Medicaid providers, and (4) providing drug therapy consultation and information to Medicaid providers.

One primary responsibility of the college is to administer the DUR Board. College faculty analyze drug utilization, evaluate new drug therapies, and formulate educational or policy strategies for the DUR Board and OMAP to consider. The faculty then facilitate and implement board recommendations through collaborations with OMAP, contracted managed care plans, or the contracted pharmacy benefit manager (PBM). The OMAP agreement requires that the faculty evaluate and report on the effect of any intervention that is implemented.

OMAP often asks for opinions and evaluation of a variety of drug policy proposals. For example, faculty were asked to evaluate an internal agency proposal to use incentives to increase generic prescribing. The faculty analyzed the feasibility of the program and its potential financial impact under different scenarios.

The agency also regularly requests drug-claim-data reporting and analysis and drug-information and policy research reports. A recent claim analysis reviewed the provider specialties that prescribed mental health drugs. A recent drug information request asked for an evaluation of new drugs used to treat influenza. A recent policy analysis request was to report on federal law and policies in other states regarding drug copayments for Medicaid recipients.

Several provider educational programs are already underway or being designed. The college faculty produce a peer-reviewed quarterly newsletter targeted to primary care clinicians so as to promote high-quality, cost-effective prescribing. Articles primarily review therapeutic topics and new drugs; occasionally news briefs cover important breaking drug information. Hard copies are mailed to all providers and pharmacies in the state. Copies are also posted on the college’s Web site at http://pharmacy.orst.edu/dur/dur_news.htm.

The faculty are now writing an evidence-based prescribing guide in collaboration with OMAP, commercial managed care plans, and professional medical and pharmacy organizations. The guide is designed as a tool for primary care clinicians. It will contain concise prescribing recommendations for common conditions treated by primary care providers, cost information, dosing information, and formulary and prior authorization information from major managed care plans in Oregon.

Faculty members offer monthly seminars to primary care providers at various clinics that primarily care for Medicaid patients. In addition, clinical faculty consult on drug therapies and respond to drug information requests from Medicaid providers.

Finally, programs are being created to provide academic detailing and drug prescribing feedback for Medicaid providers. These programs are on schedule to be implemented in spring and summer 2001; they will be the primary focus of our activities this year.

CareOregon Activities

The college faculty contracted with CareOregon to manage its pharmacy benefit program. The college prepared a form-
The current agreements provide a service to the state of Oregon, a rich learning environment for students, and many opportunities for research.

Teaching and Research Opportunities

Pharmacy clerkship students are integrated into all these activities. Students taking the Drug Information/Drug Policy clerkship respond to drug-information requests, write new drug evaluations, write newsletter articles, and formulate policy recommendations. Students research requests and present reports to the DUR Board, OMAP staff, and CareOregon staff.

Clerkship students must complete a project during their rotation. This is usually a drug-use evaluation in an ambulatory care clinic or using drug claim information. The college also offers a Primary Care/Managed Care Specialty residency that provides opportunities to gain experience in all of the activities described. There is considerable opportunity for research as a result of these arrangements. College faculty provide pharmacy policy and drug-use review services to approximately 225,000 covered lives in total, or 67% of the Oregon Medicaid population. Because both OMAP and CareOregon allow access to pharmacy and medical claim data, several projects using Medicaid claims data are underway.

Summary

The collaborations between the OSU College of Pharmacy, OMAP, and CareOregon have been beneficial for all parties. There is synergy because both organizations serve Medicaid populations and therefore their goals and patient demographics are similar. The current agreements provide a service to the state of Oregon, a rich learning environment for students, and many opportunities for research.

Kathy L. Ketchum, R.Ph., M.P.A., H.A., is Coordinator of Medicaid Programs at Oregon State University College of Pharmacy in Portland, OR. Dean G. Haxby, Pharm.D., is Director of Medicaid Programs and Associate Professor of Pharmacy Practice, Department of Pharmacy Practice, Oregon State University College of Pharmacy. Dr. Haxby is also Adjunct Associate Professor of Family Medicine, Oregon Health Sciences University and Pharmacy Director at CareOregon.
AMCP’s New Leaders

The Academy of Managed Care Pharmacy (AMCP) announced its newly elected Board of Directors and committee leadership at the 13th Annual Meeting in Tampa, Florida, last month.

Cynthia J. Pigg, R.Ph., M.H.A., will serve as AMCP President for 2001-2002. Pigg, Assistant Vice President for CIGNA HealthCare of Richmond, Virginia, is a charter member of the Academy, has served as chair of the Professional Relations Committee, a member of the Finance Committee, AMCP’s representative on the Virginia Task Force on Therapeutic Switching, and AMCP delegate to the Pharmacy in the 21st Century Conference. Pigg has served as President-elect since 2000.

Pigg replaces John Jones, AMCP President for 2000-2001, who becomes Immediate Past President. Jones serves as Director for Pharmacy Networks and Legal Affairs for Prescription Solutions, Costa Mesa, California. A member of the Academy since 1992, Jones led the Legislative and Legislative and Regulatory Action Committees; he now becomes chair of the Corporate Member Council as well as president of the Foundation for Managed Care Pharmacy.

C. E. (Gene) Reeder, Ph.D., has been named President-elect. Reeder, Associate Dean of the University of South Carolina School of Pharmacy, has served on the Board of Directors since 1998, and has been a member of the Professional Practice Committee, the Special Projects Committee, and the Strategic Development and Marketing Committee. Reeder has also served on the Board of Directors of the Foundation for Managed Care Pharmacy (FMCP), and on the Editorial Advisory Board for the Journal of Managed Care Pharmacy. Dr. Reeder will move into the office of the presidency for 2002-2003.


Incoming directors are James R. (Rusty) Hailey, M.B.A., and Debbie Stern, R.Ph. Hailey is Vice President, Specialty Markets, for Coventry Health Care, Inc., Franklin, Tennessee. A member of AMCP since 1990, he served on the Membership Committee last year and chaired the Pharmaceutical Industry Relations Committee. Stern, Vice President, Rxperts, Irvine, California, has been an AMCP member since 1990; she has served on the Public Relations Committee and on the Program Planning and Development Committee, which she chaired in 2000-2001.

Continuing as AMCP Directors for 2001-2002 are Michael Bailey, MedImpact Healthcare Systems, and Dianne Kane Parker, Pharmacia.

Committee Chairs for 2001-2002

- **Educational Affairs:** Marv Shepherd, University of Texas at Austin School of Pharmacy
- **Journal of Managed Care Pharmacy:** Craig S. Stern, ProPharma Pharmaceutical Consultants, Inc.
- **Legislative:** Steven W. Gray, Kaiser Permanente Medical Care Program
- **Legislative & Regulatory Affairs:** Cindy Bradish, Humana, Inc.
- **Membership:** Virginia Sweeter, Professional Meeting Consultant
- **Organizational Affairs:** Dennis Lyons, Pharmaceutical Strategies
- **Professional Practice:** James Utt, John Deere Health, Inc.
- **Program Planning & Development:** Beth Brusig, Sentara Health Care—Optima Health Plan
- **Schools of Pharmacy Relations:** Pallav Raval, Walgreens Health Initiatives

Special Projects: Renee Rizzo Fleming, HealthNow New York
Finance: Peter Penna, P.M. Penna, LLC
Nominations Committee: Carey Cotterell, Kaiser Permanente Medical Care Program
Ad Hoc Committee on AMCP’s Framework for Drug Therapy Management: Dianne Kane Parker, Pharmacia

Corporate Member Council

To give corporate members of AMCP a forum for exchanging ideas with the leadership, the Board of Directors has created the Corporate Member Council.

The Council replaces the Pharmaceutical Industry Relations Committee, which included both corporate and noncorporate members. The Council is a deliberative body working to identify potential ways through which individual and corporate members can collaborate to fulfill the mission and objectives of AMCP, evaluate their feasibility, and offer recommendations to the Board.

"The Pharmaceutical Industry Relations Committee played an important role," said John Jones, Past President of AMCP and the chairman of the new Council. "However, AMCP has more than 50 corporate members, so the former committee simply could not provide all those members with an appropriate forum for expressing their ideas and participating in collaboration with other AMCP members. The new Council offers that opportunity."

The Corporate Member Council consists of AMCP Corporate Members; each Corporate Member designates a representative—typically the Corporate Contact from the member organization—to the Council on an annual basis. The immediate Past-President of AMCP serves as the Chair of the Council. AMCP’s Executive Director and Membership Director also have seats on the Council.

"I believe AMCP’s Corporate Members will welcome the chance to participate in the Corporate Member Council," said John Roney, Associate Director of Health...
Systems Affairs for Procter & Gamble Health Care. "This new forum will give all Corporate Members a role in a deliberative body that will provide important input to the AMCP Board as it sets policy and direction for the Academy." The first meeting of the Corporate Member Council took place at the 13th Annual Meeting and Showcase in Tampa.

For more information, please contact Membership Director Kevin Alder at 800-827-2627.

**Bylaws Amendments**

Active members of AMCP have approved ten amendments to the Bylaws governing the Academy.

An amendment to Section 3.3, Categories of Membership, creates a new membership category of Allied Member, which is now being designed by the Membership Committee.

The amendment was proposed to allow participation in AMCP by nonpharmacist employees of managed care organizations who help administer the pharmacy benefit. AMCP has recognized that these nonpharmacist colleagues, whose responsibilities range from patient assistance to network administration to quality assurance to client support, are critical to the delivery of the pharmacy benefit. These employees often do not qualify for employer payment of pharmacy organization dues and therefore do not now participate in AMCP activities. The Board believes that these individuals would benefit from AMCP's services and therefore proposed a new category of membership specifically tailored to attract this important cadre of nonpharmacist professionals.

A second amendment to Categories of Membership separated the current Student/Resident membership category into one Student category for undergraduate students and one category for Graduate/Residency/Fellow members.

An amendment to Section 4.1, Annual Meeting, changes the name of this section to "Annual Business Meeting." The change in wording was proposed to distinguish the Annual Business Meeting of Members from the Academy's Spring continuing education meeting, entitled "the Annual Education Meeting."

The format and purpose of the Annual Business Meeting will be defined in the organization's Policies and Procedures Manual, to include member communication for Board consideration at a later date, an open forum for informational purposes, a State of Affairs report by the President, presentation of awards, and installation of directors and officers. The Committee recommended that the Annual Business Meeting should not include action items for vote.

Section 4.2, Special Meetings, was amended to require 25% of active members to pre-register in order to hold a Special Meeting. The change also allows the Board to act upon a petition prior to a Special Meeting, and requires that all votes at Special Meetings be taken by written ballot. This amendment also eliminates Section 4.8, Quorum for Meetings of Members, and Section 4.9, Vote Required at Meetings of Members, and incorporates these sections into Section 4.2.

An amendment to Section 4.5, Voting, adds the language, "Voting for dissolution shall be by written ballot mailed to members. Voting at Special Meetings shall be by written ballot."

An amendment to Section 5.1, Board of Directors, removes language regarding compensation of Board members, and adds that Board members are reimbursed for expenses incurred in connection with performance of AMCP business. The new language clarifies that Board members are not paid for service, but are reimbursed for expenses in connection with the performance of AMCP business.

Section 5.3, Election of Directors and Officers, was amended to include new language: "Candidates receiving the highest number of votes for each vacancy to be filled shall be elected. There shall be no cumulative voting. A tie shall be decided by lot."

Section 5.9, Policy Making Powers, was amended to specify that a copy of an annual report by Directors shall be made available to all members, rather than mailed to each member, as the earlier language required. The report will be mailed to anyone who requests it.

By amending Article XIII, Dissolution, the Academy clarified the distribution of remaining assets of the Corporation upon dissolution to state that members are no longer eligible payees. The Bylaws had required, in the event of liquidation or dissolution of the Corporation, that after payment of all liabilities the Board "shall distribute to each then current member of the corporation, pro rata, the remaining assets of the Corporation, up to and not exceeding the total amount of each such members' previous payments to the Corporation by way of dues and assessments."

The Academy does not have a historic database that would allow implementation of that language. Therefore, the new language stipulates that "no member, trustee, or officer of the corporation or any private individual shall be entitled to share in the distribution of any of the corporate assets upon dissolution of the Corporation." The balance of corporate funds will be distributed by the Board according to the Bylaws, which require that the Board shall distribute remaining assets to organizations primarily engaged in promoting the interests of the pharmaceutical professional, which are organized and operated exclusively for charitable, educational, or scientific purposes.

A number of other conforming changes were made to the Bylaws, which, in the opinion of the Board, did not require individual votes. Members may request a copy of the document by calling Dan Fishkin at 703-683-8416, ext. 317 (e-mail: Dfishkin@amcp.org).
Patient Confidentiality in the 21st Century

Health care providers, including pharmacists, are required under the law to obtain patient consent before use and disclosure of patient-identifiable information.

Patient confidentiality. These two words have been buzzwords in Congress since 1996, when President Clinton and Congress passed the Health Insurance Portability and Accountability Act (HIPAA) of 1996. The act stipulated that Congress pass national medical-record privacy legislation by August 21, 1999.

After much discussion and debate, Congress was unable to meet this deadline. Therefore, HIPAA requires that the U.S. Department of Health and Human Services (DHHS) issue regulatory standards. In November 1999, the President and DHHS Secretary Donna E. Shalala released a proposal; an extensive communication period ensued, with approximately 55,000 public comments reported.

On December 20, 2000, President Clinton and DHHS released the final rule. Implementation of the final regulation is to come into effect by April 2003 (2004 for entities with revenue under $5 million). Now, in the 21st century, there are minimum national standards regarding patient confidentiality.

The final regulation includes health plans, health care clearinghouses, and health care providers as covered entities. The provisions apply equally to public- and private-sector health plans and providers. The final regulation applies to all types of personal health information, including oral communication, paper records, and electronic forms. It has the following provisions: consumer control, boundaries on medical record use and release, security of personal health information, accountability for medical records use and release, and protection for psychotherapy notes. These components are included because of careful consideration from the president and DHHS regarding consumers’ comments. Below are brief descriptions of the contents of the final regulation. (For a pharmacy analysis, see: www.amcp.org/public/legislative/analysis/032701c.html).

How is a patient’s health information used? Patients themselves control the use of the information. Providers are required to clearly post notifications of how their information can and cannot be disclosed. Also, a history of disclosures must be made available to patients. Patients must give consent before information is released. Patients have the right to file complaints regarding violations of the provisions of this rule.

Health care providers, including pharmacists, are required under the law to obtain prior patient consent before use and disclosure of patient-identifiable information for payment, treatment, and health care operations, including quality assurance and disease-management programs. Providers would be required to post a notification of their privacy policies in clear sight. A health plan would not need to obtain consent for these purposes. However, given the complexities of the rule, it is thought that most health plans would rather be safe than sorry, and obtain consents from enrollees. In order to disclose information for activities other than treatment, payment, and health care operations, the provider or other covered entity would be required to obtain a specific written “authorization,” different from the generalized consent, detailing to whom the information would be disclosed and why. These types of activities would include marketing programs and the sale of data.

Under the rule, each covered business entity, including pharmacies, would be required to adopt internal privacy procedures identifying those individuals with access to the information and for what use. The business would be required to hire a privacy officer who must train and monitor employees on the privacy procedures of the organization. In most cases, this requirement would necessitate establishing a new position.

There are strict penalties for violating the privacy rules. While an individual has no private right of action, DHHS can deem that there has been a violation pursuant to a personal grievance filed by an individual, which can trigger criminal penalties for intentional disclosure.

The patient confidentiality rule does not preempt more stringent state laws on use and disclosure of patient-identifiable information. Given this provision, multi-state covered entities will have to ascertain whether federal or state laws govern in the locations where they operate. The answer may well vary from jurisdiction to jurisdiction.

Many organizations, including AMCP, have analyzed the rule and recommended changes to DHHS. Because of many concerns over the impact the final rule will have on the delivery of care, DHHS took the extraordinary step of accepting additional comments on its already published final rule. Many in Congress are already considering whether or not to introduce legislation to fix what they see as flaws in the regulation and the underlying statute. Pharmacists must take active roles in attempting to perfect this regulatory and legislative process to ensure that they can continue to provide optimal care for all patients.

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Employer-sponsored health care services

Employer-sponsored health care is a concept that may be unfamiliar to many managed care pharmacists. It deserves close examination because it is an idea that has been well received and effective. It was developed to help mid- to large-sized employers contract for primary care and pharmacy services in a manner that is cost-effective and convenient for employees (both current and retired) and often their dependents as well. Its goal is to reduce costs while improving access and quality of care. The outcomes—reduced health care costs, improved quality of care, increased worker productivity, and lower absenteeism—are well worth the investment.

The Options

At first glance, employer-sponsored health care may seem like an attempt to circumvent established managed care or pharmacy benefit management (PBM) plans. It is not. It does not replace the managed care plan, the PBM, or insurance. Instead, it augments these services with additional access points that are paid for via another mechanism. The additional access points may offer one or a combination of options: occupational health interventions, pharmacy benefits, primary care services, or corporate health services. Table 1, page 190, gives examples of each of these services.

According to Michael Hardies, M.D., chief medical officer for CHD Meridian Healthcare, industry data reveal that persons who must leave the workplace to seek health care use 12–16 times as much time as those who can meet their health care needs on the work site. This is a powerful motivator for employers to consider this creative alternative—it decreases cost, enhances quality, and improves access to service.

All services described here are offered at the employer’s work site (whether a heavy manufacturer or a corporate headquarters) or nearby, thus providing employees ready access to necessary health care. Every employer-sponsored health care program will be different; programs are tailored to meet the employer’s and employees’ needs. For example, one employer may need only the pharmacy benefit (stand-alone or à la carte program selection), while another employer may choose to implement modifications of all four options (integrated programming).

The benefits of employer-sponsored health care are easily elucidated with a little informed contemplation. Much of this activity recalls an earlier time when it was not unusual for health care to be delivered at the work site. Until the early 1960s, it was common for large employers to offer basic on-site health care, with some large companies even operating company hospitals. The employee health clinic was an important benefit in large factories or labor sites, and offered services that by today’s standard seem rudimentary. The focus was often reactive or triage: injury or acute-illness treatment and referral. With the evolution of various types of insurance and a push for patient choice, health care moved out of the workplace and into the economy in the middle of the 20th century.
What Was Old Is New Again

Today, employers are experiencing resurgent interest in on-site health benefits for their employees. One major motivator is cost. Employer-sponsored pharmacies that offer prescription services exclusively to a company's covered population can purchase pharmaceuticals directly at a far deeper discount than that available through managed care or PBM programs. Since pharmaceuticals are the fastest-growing health care cost today, this is a significant incentive for employers. The key is provision of care to a defined population. Employer-sponsored pharmacies leverage the employer's size and prescription volume to purchase pharmaceuticals directly within this "closed door" class of trade. This defined population is the reason for both the pricing differential and the restriction-to-care provision. A closed-door pharmacy can only dispense prescriptions to those who are clearly defined as beneficiaries of the client organization.

Figure 1, below, describes this class of trade with respect to other classes of trade in terms of their pharmaceutical costs.

Other savings are achieved by employer-sponsored pharmacies as well. Disease-state management and early-intervention programs are fairly standard among sites, and they are especially successful if the pharmacy benefit is offered in conjunction with a primary care service. Table 2, page 191, describes national and local-level clinical efforts that are used by pharmacies in the employer-sponsored model. Pharmacists work as indispensable members of the health care team, and their interventions or suggestions may be offered as formally as a structured chart review, or as informally as a suggestion over coffee in the employee cafeteria. The concept of pharmaceutical care is easier to implement in employer-sponsored sites than it is in other locations. Pharmacists deal with one plan and one plan only. There are no eligibility issues to resolve, and pharmacists must be familiar with only one benefit plan and design.

Employer-sponsored health care can also help organizations achieve Voluntary Protection Program (VPP) status with the Occupational Safety and Health Administration (OSHA). OSHA's VPP is designed to recognize and promote effective safety and health management. In the VPP, management, labor, and OSHA establish a cooperative relationship at a workplace that has implemented a strong program that meets an established set of criteria. OSHA publicly recognizes the site's exemplary program, and removes the site from routine scheduled inspection lists (OSHA may still investigate major accidents, valid formal employee complaints, and chemical spills). VPP participant sites generally experience 60%-80% fewer lost workdays attributable to injuries than would be expected of an "average" site of the same size in their industries.

One health care administrator learned the value of employer-sponsored health care when his organization scaled back their services. "It was disastrous," he said. He went on to say that administrators...
believed that since they were already paying for other types of insurance for their employees, savings could be reaped by sending employees out to their own physicians or health plans. “This was an ill-conceived approach to managing cost. What little was saved up-front was immediately lost to increased absenteeism and increased risk. Any organization that is serious about absence management should consider on-site employee health services a worthwhile investment.”

**Earning Market Share**

Employer-sponsored health care’s success is contingent upon drawing customers from the client’s workforce. Employee participation is voluntary. Employer-sponsored health care offers convenient locations and hours of operation that accommodate the workforce, a copayment differential, and some added benefits. These factors promote better compliance and improved utilization management. Convenience goes beyond placement of a pharmacy on the grounds of the employer’s factory or firm. Some organizations place pharmacy drop-boxes throughout the plant, or staff a drive-through window. All emphasize customer service. Even in the largest of organizations, a sense of community, loyalty, and ownership is common; employees come to know their health care providers as members of their community, and welcome “their” health care providers to their work teams. As the most accessible members of the health team, pharmacists hold a special place in these patients’ esteem. A pharmacist who has good communication and customer-service skills enhanced with underpinnings of clinical expertise can cultivate loyalty and trust.

Some specific pharmacy care programs have been enormously successful at work sites. Several deserve mention:

- Brown-bag programs encourage employees to empty their medicine cabinets into brown bags and bring them to their pharmacist for review. Polypharmacy, noncompliance, and potential drug-interaction issues can be identified and rectified.
- Pharmacist-administered vaccinations for employees who travel overseas, or as simple preventions (influenza and tetanus), are gaining popularity in states where this practice is allowed. Many employees would go without a flu shot if they had to schedule an appointment or pay a copayment. On-site vaccination that is inexpensive or free motivates good prevention.
- Coordination of hyperlipidemia and Helicobacter pylori screening programs that educate high-risk patients with verbal and written information have been successful at many sites.
- A half-tablet program that takes advantage of pharmaceutical manufacturers’ pricing strategies has reduced costs by up to 5% at some sites.
- Addition of over-the-counter (OTC) or alternative/complementary drugs has helped increase the likelihood of positive outcomes for patients who need or want these items. Convenient availability of OTC items provides a lower-cost treatment strategy for some conditions. For example, patients may be more willing to accept that they have a viral infection that does not require antibiotics when they can obtain symptomatic treatment without leaving the clinic.

**Proof of Success**

Pharmacy managers within employer-sponsored health care systems, like pharmacy managers in many managed care sites, are heavily dependent on reliable, advanced information technology (IT). IT can help managers share best practices among sites, identify geographic patterns of drug use, and broadcast policy, information, and educational materials to pharmacists. Information managers must constantly look for ways to improve the organization’s IT pharmacy applications, and apply them in ways that lead to improved outcomes for patients and decreased costs for the sponsor.

Currently the emphasis is on upgrading IT systems so that the systems move toward the ideal, paperless medical record. Future systems will also incorporate lab values and outcome measurements, better data retrieval, and patient-care modules.

Accreditation by an established group constitutes the highest form of public recognition, and stimulates continuous improvement. Program quality should be validated by the Accreditation Association of Ambulatory Healthcare (AAAHC) or a similar group.

The ultimate measure of success is the customer-satisfaction survey. Employees who choose to use the sites generally rate them highly, and are more likely to return to the pharmacist for review. Polypharmacy, noncompliance, and potential drug-interaction issues can be identified and rectified.

**Implications for Managed Care Pharmacists**

Many large employers currently contract for health care services. Companies such as Bethlehem Steel, General Electric, Goldman Sachs, and others have reported significant savings from employer-sponsor...
Sachs, International Paper, and Toyota Motor Manufacturing currently use employer-sponsored health care services. The direct-contracting model works for them, and in the future, this type of program will grow. It is mutually beneficial for the employer, the employee, and care providers.

There is growing opportunity in this type of setting for pharmacists who wish to practice in diverse locations and offer a level of service unmatched in community practice. Patient access is unfettered and the pharmacist's role on the health care team is valued. Consequently, pharmacists who work in this type of environment experience high levels of satisfaction.

Total pharmacy savings for employers can be 15%–25% or higher. While the efficacy of each program depends on market penetration of total prescriptions, efficacy of pharmacy care programs, and impact on total health care costs, the day-to-day contributions of highly motivated pharmacy professionals are the most valuable drivers at employer-sponsored pharmacies.

## Conclusion

Employer-sponsored health care works. Its customers are identified on two levels: At the corporate and industrial level, employer-sponsored health care is well received because health care costs are lowered and absenteeism is reduced. With these two issues creating tremendous concern across the nation, any improvement is of great value. For the employees who receive health care services at their work sites via employer-sponsored health care, this delivery method is welcomed as an efficient way to improve quality of life. Small health problems are resolved before they develop into serious problems and health maintenance is convenient.

This old idea has been reinvented in a way that is much improved. Employer-sponsored health care models define their customers differently than other models, emphasize accessible care, and reduce cost. This type of service is attractive to employers, and will continue to grow. It is a distinct and growing opportunity in a unique market segment. This will continue to create
Designing a Framework for Pharmacy Practice: A Look at Consumer Reactions and Expectations

The Academy of Managed Care Pharmacy (AMCP) has had a task force at work since early 1999 to design “Pharmacy’s Framework for Drug Therapy Management in the 21st Century.” While there has been no shortage of studies and committees exploring the future of pharmacy, AMCP’s endeavor has one important feature that sets it apart from previous efforts: It sought direct input from pharmacy’s customers—specifically, academicians, drug manufacturers, employers, government officials, health plan administrators, patients, and physicians.

AMCP sees these individuals as key “consumers” in managed care pharmacy. And because AMCP values their health care decision making, the organization felt it was critical to include these groups’ voices in creating a pharmacy framework that responds to their needs and expectations.

Toward this end, AMCP conducted a telephone survey of 20 individuals in September and October 2000. Some of the results were unexpected; others were compelling. In essence, it was felt that sharing these insights could help stakeholders work together to design a more sensitized framework for pharmacy practice.

Respondents included two academicians, two representatives from drug manufacturers, four employers, two government representatives, five health plan administrators, two patient representatives, and three physicians. Each was asked about seven key customer expectations. Of these seven expectations, five prompted the most thought-provoking responses among the interviewees:

• Drug-related problems will be identified, resolved, and prevented.
• Care is coordinated.
• There is value in the care that patients receive and it is affordable.
• The system is accessible and is looking out for the patient’s best interest.
• The system will provide adequate and appropriate information and education regarding appropriate drug use.

This section includes responses to the areas addressed within these five expectations.

Asterisks (*) separate interviewees’ responses. A diamond (◆) indicates that no differing or compelling statement was made.

**Drug-Related Problems Will Be Identified, Resolved, and Prevented**

Many of the respondents noted that while society generally expects that drug-related problems will be identified, resolved, and prevented, they say that: (1) such efforts are not being carried out; and (2) computer systems that link certain drug-therapy data between physicians’ offices and pharmacies would help identify potential adverse drug events.

(1) Drug-related identification, resolution, and prevention efforts are not being carried out.

Academicians (one of two respondents agreed): “There are some good systems for monitoring and detecting drug-drug interactions using sophisticated software, but having the software and rating systems currently in place can never overcome a reimbursement system that works in the opposite direction.”

***The Responses***

This section includes responses to the areas addressed within these five expectations.

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Drug manufacturers (two of two respondents agreed): Both respondents noted that there are opportunities to improve current efforts. "Managed care pharmacists are actually in a pretty good position to more closely mimic a hospital pharmacy than a retail pharmacy, with the added benefit that they can reach more people through sophisticated use of formularies and availability of drugs, and a sophisticated linkage with the medical partner of their managed care organization in which they view disease management as an objective. They may (target) diseases that cause multiple visits to specialists and hospitals or that require emergency room visits."

Employer purchasers (three of four respondents agreed): "I think the systems are in place—they are good and the health care offerings that the employers have do look closely at the drug component so that there's adequate access, it's affordable, and there's some level of cost-sharing. However, in many cases employers feel they are paying for a drug benefit and they're not sure what outcomes they're getting from it." *** "The largest insurer here has 75% of the marketplace and has a drug benefit program that employers buy as part of the benefit. Yet there's a feeling that employers have of, 'why am I spending all of this money on drugs when you haven't shown me anything?' Even in [the insurer's] disease-management program, drug is an after-thought with them. It's not an integrated approach. I haven't seen anything that shows an integrated model with good outcomes. [As an employee benefits consulting group], we've been able to show with some of the health conditions that by appropriate medical and drug treatments, you can increase employee performance. One example is Heinz. During certain times of the year they do a lot of wellness education on allergies and the use of sedating versus nonsedating because Heinz has bought into the model that says that nonsedating antihistamines will increase productivity and are a safety component. [The employer has] also pushed this back to the health plan and asked that the non-sedating antihistamines be placed in an appropriate therapeutic class of being preferred because of the fact that they are a manufacturer."

Government representatives (two of two respondents agreed): "Part of what we're trying to do in this Congress is encourage research into what else can be done with regard to medical errors. This is research into how we perceive and address the problem, in other words, comparing our medical system to other systems, such as the airline industry, and how they handle problems. It includes conducting some of the research that has not been done on drug-drug interactions. We don't have hard research that we can tell doctors and pharmacists about certain things."

Health plan administrators (three of five respondents agreed): "There are no universally applied effective systems in place. HEDIS [the Health Plan Employer Data and Information Set] is not addressing the drug therapy process—and should.*** "I think the system is much more proactive and is working well. People are getting in the system earlier because they are more knowledgeable and more have health coverage than ever before."

Patients (two of two respondents agreed): "Consumers, even advocates, don't understand where health care decisions (much less process decisions) are being made. That process is closed and there's no way for consumers to really know what's going on. Nor do all consumers always have an adequate appeals process or independent review. They should have that as well. Certainly decisions (about what drugs to include in a health plan) should be made, but how we do that is more difficult."

Physicians (three of three respondents disagreed): "The current system is moderately effective at identifying and resolving drug errors and adverse events. I always found it kind of a joke that the FDA [Food and Drug Administration] sends out the forms doctors are supposed to fill out when they identify adverse drug reactions. Now I don't know any doctors that fill those out. They may see an adverse reaction—the side effects of something—and unless the pharmacist finds out about it, which I think they're better at identifying and reporting, it's overall a moderate effort. Certainly the more major events are likely to be reported, where someone has been hospitalized."

(2) Linked computer systems would help better identify potential adverse drug events.

Academicians (two of two respondents agreed): "Pharmacy-based information systems are rarely used, and if used, there's no payor on the other end to recognize the value of those services. These type of programs are successful at reducing total [health care] costs, but they always increase drug therapy costs."

Drug manufacturers (two of two respondents agreed): "[This is also] a systems issue. There aren't systems in place to do things like provide outcomes data. If in fact we had a true physician/patient interaction system, something that captures electronically that interaction in the doctor's office and is put into a database, then you would have real-time studies. We miss the opportunity as soon as that patient sits down with the physician. The information, including the prescription, gets put on a piece of paper and gets filed away and is inaccessible to the rest of the health care system in most cases. That's why I think an electronic patient record form in U.S. health care would change the dynamics of health care delivery."

Employer purchasers (four of four respondents agreed): "PBMs [pharmacy benefit management companies] have done an excellent job with the messaging systems in place—we don't have that on the medical side. Pharmacy has been up to speed with technology, but it's a shame that we don't use it to get the pharmacist involved in it up front. Especially with all that point-of-care technology they talk about today. A physician could just do the diagnosing and this technology could help the doctor prescribe the right drug based on the plan's formulary and other conditions the patient has."
Government representatives: (two of two respondents agreed) “As a health care system, we ought to move toward electronic prescribing and record keeping. But the question is, ‘which sector absorbs the cost?’ Electronic prescribing and record keeping lends itself to electronic patient compliance as well. There are some systems that monitor compliance through refills. Certainly the pharmacist can’t be responsible for calling patients every four hours to make sure they’re taking their medications. I hear about systems that are in place in pharmacies where they flag drug-drug interactions before they’re filled, so either the pharmacists are escaping right past the flag or are turning the system off because it’s a nuisance, and because they are thin on their margins.”

Health plan administrators (five of five respondents agreed): Linked systems are good, but certain efforts, like routine and preventive care is “best carried out by non-MD types.” *** “The only time we see any attempt at this [linking systems] is when we have money, but it usually falls by the wayside for other things. It happens every three to five years. So we don’t get very far because it’s just too complex to try to develop and link everything. Plus, with people moving in and out of plans, that makes it hard to do long-term studies. I think what will happen in the future is that a SmithKline or a Merck will open their own disease-centric sites, such as a diabetes center, and have people get a full array of services for their conditions.”

Patients (two of two respondents agreed): “The resources that consumers are using to get information are the Internet; talking to doctors, pharmacists, friends, and relatives; and TV and radio.”

Physicians (three of three respondents agreed): “Improved automation and the application of technology are needed] where doctors don’t have to think about their selection of drugs or scheduling of follow-up. Patients may change doctors and health plans, so a common database—a linking of databases by sharing of data electronically—would be very helpful.” *** “There are emerging more and more automated systems to try and catch potential drug-drug interactions, identify allergies, and these kinds of things before drugs are delivered. That will work best where the patient gets all their medications at one pharmacy or one pharmacy chain.”

Care Is Coordinated
All respondents believed that coordination of drug therapy is particularly essential when care is provided by multiple health care professionals. They also said that communication among such providers is important. However, while many providers are competent, most respondents said that: (1) Few pharmacists are involved in collaborative, multi-disciplinary care; and (2) the drug therapy process is still very much a paper-based, nonintegrated system that will require an investment in computer systems to coordinate and integrate medical and pharmacy information.

(1) Pharmacists are involved in multi-disciplinary care.
Academics: (two of two respondents disagreed): “This is not often achieved. In some areas, such as diabetes and asthma, pharmacists are involved, but there are certain areas where they aren’t and where compliance is very important, such as hypertension.”

Drug manufacturers: (two of two respondents disagreed): “So much of a pharmacist’s job is regarded as physical dispensing: interpreting the prescription correctly, drawing it down from the inventory, counting out the requisite number of tablets, and then getting it to the patient, and increasingly, within the constraints of whatever health plan the patient is covered by. There is a whole other aspect of pharmacy, which is counseling and drug-utilization review, and even screening. In a hospital setting where you have a salaried pharmacist, they probably practice many of these broader disciplines.”

Employer purchasers: (four of four respondents disagreed): “In California, big group practices have—from what I’ve heard—pharmacists on staff. I think that’s ideal. Pharmacists should be working in the outpatient arena, not just the drug stores, but for groups of physicians they should be consultants providing their expertise. Perhaps they’re reviewing a week’s worth of cases that a doctor might see to see what drugs have been prescribed and what may or may not have been prescribed appropriately. If doctors don’t have time to go back and check everything about a patient, to know that someone is monitoring them [is good]. Basically now there is no accountability. There might be in the hospital, but there isn’t on the outpatient side.”

Government representatives (two of two respondents disagreed): “Certainly the PBMs and managed care plans have been outspoken in demonstrating how they have the ability to operate effective disease management programs. But the pharmacist has to be an integral part of that.”

Health plan administrators: (four of five respondents disagreed): “Pharmacists are often among the first to see things going wrong with patient compliance because patients come in for refills more frequently than they go for doctor visits—yet they are out of the loop with other providers,” says one administrator. He continues, “There’s an opportunity for quality control. They could reinforce preventive services—remind patients to get a mammogram or make sure the kids are immunized.”

Patients: (two of two respondents disagreed): “I don’t know that people think of their pharmacists as a key player in the use of pharmaceuticals. When I ask pharmacists a question, I feel like I’m bothering them. In fact, when I go to pick up my prescription, I’m asked to sign a form, which automatically includes the sticker, ‘I do not want consultation.’ When you sign, it looks like you’re signing for your drug. But there’s an assumption that you do not want a consultation. It certainly doesn’t suggest to someone that, ‘Oh, I can talk to..."
my pharmacist about this.”

Physicians (three of three respondents disagreed): “The pharmacist shouldn’t just be the lackey of the physician—do whatever I say.’ A relationship between the physician and clinical pharmacist [should] set some guidelines or norms as far as that relationship and making decisions. Also, clinical pharmacy management programs should be monitoring and measuring their results and outcomes and have that be their ‘truth in advertising.’ It would let the referrers—the physicians—know what results you get.”

There Is Value in the Care That Patients Receive, and It Is Affordable
All the respondents believe that drug therapy plays an important role in the quality of care patients receive. However, they vary in the degree to which they feel that: (1) the cost of drug therapy is an important consideration in the selection of drug therapy options; (2) the value of drug therapy is demonstrated in improved health and higher employee productivity; and (3) the value of drug therapy is reflected through lower drug benefit costs.

(1) Drug cost should be considered in therapy selection.
Academicians (two of two respondents agreed): “Drug formularies can get at drug costs, but recommendations around use of certain drugs—evidence and supporting information—should be used.”

Drug manufacturers: (two of two respondents agreed): “I do constantly remind people that price increases are a small portion of the total, and in fact, relative to what the newer products do versus the older products. We have to keep in mind is that we’re talking about improved quality of life, the ability to keep people out of the hospital; then the answer is: there should be cost-benefit there. But it is a very difficult argument to get people to focus on.”

Employer purchasers (four of four respondents agreed): “[The cost of drugs] is not painful for most consumers, but it is if you don’t have coverage.”

Government representatives (both respondents both agreed and disagreed): “In some cases cost is an important consideration. Nowadays with chronic illnesses, like Alzheimer’s, the two drugs price-wise are the same. If you focus too much on cost savings, you don’t get the full picture of appropriate use. Health care is not like a contract with the defense department where you’re ordering parts.”

Health plan administrators (five of five respondents agreed): “Health plans should be talking with the pharmacists and vice versa regarding what the health plan is doing regarding therapy decisions. On our part—and we should be doing this and we’re not—health plans should be educating the pharmacists about what the P&T [pharmacy and therapeutic] committee is doing and involve them in our therapy decisions.”

Patients (two of two respondents agreed): “A lot of Medicare beneficiaries have joined HMOs, mostly because of the prescription drug coverage. But now that that’s being decreased quite a bit and there are more expensive drugs, they have a lot of anxiety about how they’re going to continue to pay for their drugs. There’s also a concern [among consumers] about rising insurance costs, and formularies and their restrictions. They feel, and appropriately so, that these decisions are made by managed care companies with only the cost in mind, and that the physicians have been brought into the process of rationalizing the cost of drugs.”

Physicians (three of three respondents agreed): “It would be inappropriate to not weigh in the cost. Cost to the individual member, but overall cost to the health plan, then the employer, and then the society—patients and doctors need to make that link more often. Even though the copayment may be only $5, and it’s one of the more expensive drugs, we ought to be looking at alternatives because there are limited resources out there.”

(2) Drug therapy value reflects improved health and higher employee productivity.
Academicians (two of two respondents disagreed): There is significant lack of accountability in drug therapy, says one academician: For example, he says, “a health plan fragments the system when it turns the drug therapy benefit over to a company like PCS, who in turn can restrict the formulary and has carte blanche to do whatever they can to manage the budget. The fact that they’re not managing hypertension patients with optimum drug therapy, for example, is irrelevant. They’re reducing drug costs and that’s what they’re paid to do.”

The flaw in the current system is that it’s not in the managed care organization’s benefit to do things that will prevent the disease in two to five years because the patient may not be covered by the plan for more than one year. So there’s no incentive for the managed care organization to work with people on smoking cessation and weight control and exercise, because that’s not going to save money now.”

Drug manufacturers (two of two respondents agreed): “I think you have to look at the value of the pharmaceuticals, not the cost, and that we do that in everything we purchase. We trade off the cost of what we’re going to pay versus the benefits that we’ll receive.”

Employer purchasers (four of four respondents agreed): “I do constantly remind people that price increases are a small portion of the total, and in fact, relative to what the newer products do versus the older products. We have to keep in mind is that we’re talking about improved quality of life, the ability to keep people out of the hospital; then the answer is: there should be cost-benefit there. But it is a very difficult argument to get people to focus on.”
respondents disagreed): “Disease management is a positive step in the right direction, but the danger is that the pharmaceutical industry has jumped on that bandwagon and gotten into that business and in a very subtle way is trying to promote the use of their drugs. They never name the drug specifically, but they see it as a marketing strategy. [As an employer], I would not use those programs because I see a conflict of interest. PBMs are suspect, too, because of their rebate incentives.”

*** “Unlike larger employers, small employers lack the sophistication about health care quality. It’s perhaps the less mature managed care markets where those employers lack that kind of sophistication to get past costs. You’ve got to get past that because if you can improve health outcomes, you will eventually improve costs. As an example, a lot of employers today won’t cover Zeneca for obesity, and they don’t understand the kind of morbidity associated with weight gain and [that] if you can reduce weight you can reduce cholesterol and diabetes-related incidents. I think we’re at a point right now where we need to educate employers about total health outcomes.”

Government representatives (two of two respondents disagreed): “The drug-utilization review system is how we identify prescribing patterns [for Medicaid] and it has been effective, but generally, systems aren’t in place in our health care system to determine if patients are getting the appropriate therapy for their conditions.”

Health plan administrators (five of five respondents disagreed): ◆

Patients (two of two respondents disagreed): “I don’t know that people think of their pharmacist as a key player in the use of pharmaceuticals. I know when I ask pharmacists a question, I feel like I’m bothering them. In fact, when I go to pick up my prescription, I’m asked to sign a form, which automatically includes the sticker, ‘I do not want consultation.’ When you sign, it looks like you’re signing for your drug. There’s an assumption that you do not want a consultation. It certainly doesn’t suggest to someone that, ‘Oh, I can talk to my pharmacist about this.’”

Physicians (three of three respondents disagreed): “Patients want to do the best they can, but they face a barrier in that if the cost is too high and even if that’s what they know that’s what they should take, they’re not going to be able to [afford it]. A major barrier [to good outcomes/compliance] is dosing; patients with one- or two-times-a-day medications will have better compliance than those who have three- or four-times-a-day dosing requirements.”

(3) Drug therapy value is reflected in lower drug benefit costs.

Academicians (two of two respondents disagreed): See #2.

Drug manufacturers (two of two agreed): “Employers have been asking health plans to carry [most of] the burden of the cost of drugs. The health plans are very mindful of it. Because they are measured on those budgets, they have more or less the ability to impact that depending on the amount of control they have over being able to direct drug therapy to patients.”

Employer purchasers (four of four respondents disagreed): It is possible for the value of the drug therapy to be reflected in the drug benefit, says one respondent. “The managed care and pharmaceutical industries think that employers have tons of resources that they can purchase these [dis-ease-management programs] when in reality the HR [human resources] and benefits budgets are just squeezed like you wouldn’t believe. Take health-risk assessments [HRAs]. If a company were doing annual HRAs that loaded into a database, I think you could really find a lot of potential, undiagnosed folks and recommend them to a primary care physician for screening or evaluation, but in reality, very few employers do health-risk assessments. It would be nice if some MCOs [managed care organizations] or PBMs could include that.”

Government representatives (two of two respondents disagreed): ◆

Health plan administrators (four of five respondents disagreed): Drug therapy value would be best reflected if ‘doctors would diagnose the illness and the pharmacists would prescribe the medicine. I would like to see that happen because the pharmacist is more attuned to the medications than the doctors are.”

Patients (two of two respondents disagreed): “There’s concern [among consumers] about formularies and their restrictions. They feel, and appropriately so, that these decisions are made by managed care companies with only the cost in mind, and that the physicians have been brought into the process of rationalizing the cost of drugs.”

Physicians (three of three respondents disagreed): “One of the concerns I have is that because of the payment systems and the at-risk systems and the preauthorization systems, it’s often putting the pharmacist in the uncomfortable position of trying to broker what the health plan is demanding—‘We won’t pay for this drug’—and the pharmacist wants to prescribe. That’s a very difficult and unreasonable position. It’s less a discussion around appropriate therapy options than it is what will the health plan or insurance company pay for.”

MCOs can and sometimes do change formulas frequently, which can change the patient’s medication, so that’s been at the MCO’s request, not the physician’s or the patient’s request. Trying to coordinate the drug therapy of a patient who has different providers is difficult. Also, some patients don’t understand why you need to treat hypertension for 5 to 10 years to get any benefit. They may think that ‘If I’m not getting a benefit immediately, then I don’t need to stay on the medication.’ I think we as society look for an immediate fix, an immediate cure, and don’t look for the long term.”

The System Is Accessible and Is Looking Out for the Patient’s Best Interest
In terms of this expectation, respondents believed that: (1) most pharmacists do not have access to clinical and patient data, but they disagree on whether they should; and (2) pharmacists must do a better job coordinating drug therapy concerns through coordination of care with other providers or through enhanced patient services.

(1) Give pharmacists access to patient data.

Academicians (two of two respondents agreed): “The dispenser has almost none of the clinical data to help assure appropriate drug therapy— it obviously would help. Currently [the exchange of such data] is at a pretty low level.”

Drug manufacturers (two of two respondents agreed): “Managed care pharmacy isn’t involved in the physical act of dispensing, therefore they can be involved in the act of thinking through how pharmacy care should be delivered. They have access to data on individual patients and all patients in the system. Access to those data, particularly if it’s integrated with the medical diagnosis data— in other words, being able to cross-integrate the diagnosis, treatment, and the outcomes—is a huge potential advantage for managed care pharmacy.”

Employer purchasers (four of four respondents agreed): “The model I’ve always tried to encourage people to think about is a system where the pharmacist is a primary care provider, where the pharmacist gets involved at the prescribing level with the physician at the drug-selection process. Our system today doesn’t support that for a couple reasons: Physicians wouldn’t allow that to happen because it would mean lost revenue for them, and pharmacists don’t have the adequate training or resources to make that happen. Some chains are trying to improve that with counseling centers.”

Government representatives (one of two respondents agreed): “There will always be a constant push and pull between the doctors, and I’m not sure I want to weigh in on that yet because I am a layperson when it comes to these areas. But I think that is one place where the more integrated systems of health care delivery have an advantage, and to the extent to which we are moving away from integrated systems is a disadvantage.”

Health plan administrators (four of five respondents agreed): “Pharmacists should have access to such data. It’s definitely important for them to understand what’s being prescribed and are there any other contraindications out there. It is not their place to question what the therapy outlines are, but they should be able to have access to all pertinent data. This is a major quality part of the equation.”

“Our clinical information system is set up so that our physicians and pharmacists can see what drugs the patient is on. If either party has questions about the patient, they have the ability through this system to easily share information and concerns. We have taken further steps with additional programs to improve drug therapy outcomes. We have an anti-coagulation clinic that just focuses on patients who are on anti-coagulation drugs; the clinical pharmacists run that program with the physicians’ input.”

Patients (two of two agreed): While respondents agreed with this type of collaboration, they also felt that physicians should decide what type of drug patients get: “Ultimately patients should get the drug that their physician says they should get and it should be the physician who determines whether the drug is effective or not, and if it is determined to be effective, that the drug should be covered and covered at the copayment of the [health plan’s] preferred drug. So, for instance, if the plan only covers a certain drug for a particular condition, but the physician feels another drug is more effective, the plan should [allow the [patient to have the same] copayment for the physician-recommended drug as its preferred drug.”

Physicians (two of three respondents agreed): “I think pharmacists should have a moderate amount of patient clinical data, definitely allergy, and certainly other medications. I’m not sure they need the full patient record from the doctor visit, with the detail of medical history.”

“Many pharmacies have put in monitoring systems—do they have access to all patient data, clinical lab results? No. Nor do pharmacists have information about other drugs patients may be taking. I think good clinical pharmacists are looking out for the patients’ best interest but are handicapped by the lack of patient information and lack of reimbursements for efforts to better monitor and manage patients.”

“Physicians have been recouling, particularly as their incomes have gone down and they’re feeling hammered on by insurance companies and it makes them disgruntled and makes them say, ‘I don’t want my patient to be cared for by a pharmacist or by someone else; I don’t want to share information.’”

(2) Pharmacists must improve drug therapy coordination with other providers.

Academicians (two of two respondents agreed):

Drug manufacturers (two of two respondents agreed): “Pharmacists need to collaborate with other providers in the system. I think the Internet will assist in this collaboration. I see a great role for pharmacists in demand-management programs where they actually monitor and follow patients and proactively call them. I know that managed care companies are looking at the role of pharmacists doing this.”

Employer purchasers (four of four respondents agreed):

Government representatives (two of two respondents agreed): “Right now there’s little teamwork going on in managed care— where, for example, a pharmacist has individuals referred to him. That’s what managed care should be about— professionals working as a team. There needs to be a case manager or medical social worker to work with patients. We feel that pharmacists can work with these individuals more closely; there’s a lot of potential for pharmacists to take on this role. I think other health professionals— nurses, dieticians, or exercise experts— could be a part of..."
this. The pharmacist is the best person to
be there to counsel the patient for per-
sions taking multiple drugs, especially
people with chronic conditions.”

Health plan administrators (five of
five respondents agreed): “In our medical
offices [group model HMO], we have
clinical pharmacists as well as operation
pharmacists in each of those medical
offices. So the interaction between the
nurse practitioner, the pharmacist, the
physician, and the physician assistant
occurs very easily as a result of the fact
that they work for the same organization
and have the same common goals.”

Patients (two of two respondents agreed):
“I think now there’s a lot of turf battles. I
think in a lot of other settings—hospitals
and some managed care settings—that’s
starting to change, with pharmacists and
physicians working together as teams with
other providers, nurses, etc. It’s been found
that when doctors and pharmacists work
together and communicate on a regular
basis, that patient care is better, hospital-
ization goes down, and that there are fewer
errors, especially medication errors.”

Physicians (three of three respondents
agreed): “In the present setting, I think
pharmacists could provide checks and bal-
ances for doctors, watching for drug inter-
actions, potential problems with allergies,
giving a certain amount of added education
for patients, perhaps advising other ancil-
ary services or devices that may be useful
to the condition/patient. I would like to see
an expanded role for the pharmacist in
assistance in drug selection.” *** “As a soci-
ety we’re better at reporting on Firestone
tires that need to be recalled than to identi-
fy patients who need to be on medications
who aren’t. One obstacle is the feeling that
pharmacists, physicians, any provider that
touches the patient needs to spend less time
with that patient and see more patients in
order to generate an income. In general,
patients tend to move around a lot more to
doctors and pharmacies and it’s difficult to
get the [providers] or their electronic sys-
tems to talk to each other.”

The System Will Provide Adequate and

Appropriate Information and Education
Regarding Appropriate Drug Use
The interviewees all agreed that informed
patients are the key to improving compli-
ance with drug-therapy regimens and to
improving their health outcomes. The
respondents differed somewhat, however,
in their perceptions about whether patients receive and understand drug ther-
apy education, including the purpose for
drug intervention, and therapy options
including lifestyle changes and self-care.

(1) Patients receive and understand
their drug therapy.
Academics (one of two respondents
agreed): “Patients receive criminally negli-
gent information about their drug ther-
apy. They also do not understand how
poorly their drug therapy is managed.
Plus, their expectations are extremely
low.” *** ”We’ve transitioned from a time
where sick patients went to a doctor and
took the prescription and treatment, to
one where we’re giving the patients infor-
mination and choices about their treat-
ment, and they’re making decisions
about the diagnosis. I think that’s good;
the baby boomers are approaching their
senior years—throughout their lives they
have demanded responsibility for their
well-being and they’ll continue to do
that. But while individual physicians may
allow that, the system overall is not set up
to do that because the people who pay for
the care may feel differently than the peo-
lies who provide the care.”

Drug manufacturers (both agreed and
disagreed): “If you’re a college-educated
45-year-old woman who insists on know-
ing what your options are—‘What are
the different diagnostic tests I can take,’
‘What are the different results,’ ‘How do
you interpret the results,’ ‘What’s the vari-
ation of response typically with this test,’
What are my treatment and prescription
options’—then you’ll generally get a
great deal more information [from the
doctor] and good advice. Someone less
willing to ask all those questions and who
is perhaps less well-educated, and older,
may not get the same sort of breadth of dis-
cussion.” *** “AAFP [American Academy
of Family Physicians] has encouraged
pharmacists to be physician-extenders,
which is a first step of what pharmacists
can do. Maybe something that AMCP
could do is look at how to bring these
groups together to talk more about these
 collaborative things that need to be done.”

Employer purchasers (four of four
respondents disagreed): “There aren’t a lot of
opportunities for pharmacists to provide
clinical intervention/counseling at the
retail level because time is not on their
side. Often they just want to give patients
the prescription without having them wait
too long. Plus, retail pharmacists are often
understaffed. That’s a challenge for any
PBM or that any pharmacy system has on
the retail side. Some PBMs are trying to
fine innovative solutions to try to include
the retail pharmacists.” *** “I still see very
little patient education going on, over the
counter and in terms of follow-up. From
what I’ve seen not a whole lot has changed
in maybe 20 years. The pharmacist is by
and large busy filling prescriptions, taking
care of paperwork, and following up on
telephone calls.”

Government representatives (two of
two respondents disagreed): “We hear sto-
ries [from consumers] about counseling
and compliance, that the counseling is
not being done as it’s intended to be
done. For the large part, I think the busy-
ness of the pharmacy is to blame, so the
question is, ‘How do we relieve the pres-
 sure on the pharmacist so the pharmacist
can fill in the role that policy makers would
want the pharmacist to do?’ Policymakers
are clearly aware that we are facing a phar-
macist shortage. The question is, are there
some things that can be done in a different
way—pulling pills off shelves, counting
pills, utilizing more automated and pack-
aging systems—to make it easier for phar-
macists to do their job?”

Health plan administrators (three of
five respondents agreed): “Less than half
the diabetics in the United States are
under appropriate therapy. Even under
well-run diabetes-management pro-
grams, there’s probably 70% who are
Designing a Framework for Pharmacy Practice: A Look at Consumer Reactions and Expectations

properly managed. Patients still have little understanding of their disease. Less than a third of patients conclude their course of antibiotics appropriately—something as simple as that. We've still got a long way to go.”

Patients (two of two respondents disagreed): While consumers often look to direct-to-consumer ads to get their information on drugs, “they feel those ads don't give them the full information about risks and side effects and safety issues. What they're doing is looking at the ads and pulling up more information on the Internet.”

Physicians (three of three respondents disagreed): “I think education of the patient often gets short shrift. Patients often don't get that unless they seek it themselves, ask questions or get it on the Internet. They've too long relied on doctors to spoon-feed them through the process.”

Conclusion
The AMCP Task Force is continuing its deliberations on these findings, and is expected to have a framework ready for comment in late 2001. In the meantime, the project, funded by the Foundation for Managed Care Pharmacy (FMCP), is preparing a list of critical functions in drug-therapy management, along with an example of what a perfect score in that function might look like, and a self-assessment instrument for pharmacists to determine how well they are prepared to practice at the level of the Framework. The final product will be a generic document and practice-site blind, but will include specialty-specific assessments.
Increasingly, the explosion in scientific knowledge is overwhelming both researchers and practitioners in the health professions. The managed care pharmacist today needs a constant and current sense of the basic pharmaceutical sciences, clinical pharmacy, pharmacy management systems, health policy and ethics, new drug introductions, pharmacoeconomics, and pharmacoepidemiology. Monitoring the ever-changing pharmaceutical industry is now more than a mere pastime.

Fortunately, there has been a corresponding growth in support available to the pharmacist manager, practitioner, and researcher, in the form of free Internet resources and other proprietary databases that allow access to published materials, organizational contacts, and other resources for informed decision making.

Evidenced-based clinical approaches, cost-effective care strategies, and program descriptions and evaluations can all be found in databases described below.

Knowing how to navigate these information services is crucial to avoiding information overload. This article will first describe some information retrieval databases that can be used to search for articles relevant to pharmacy administration. It will then outline search criteria to determine the yield of each database and demonstrate how to decide the relevance of potential information sources. We restricted the scope of this article to computer-searchable and accessible databases.

### Bibliographic Databases

The bibliographic database is the most common source for published articles. Most bibliographic databases allow users to locate articles by keyword, author, and title. The search results usually yield title, authors, source, and an abstract of the article.

The abstract usually provides enough information about the relevance of an article to support a decision about whether to obtain a full-text copy. Articles from core journals can be found in a local library or university library system and sometimes through an interlibrary loan. Many information database providers will supply a photocopy of articles or allow users to download the article for a fee.

**MEDLINE**


MEDLINE is the premier medical information source. Since June 26, 1997, the MEDLINE database has been accessible, free of charge.

MEDLINE covers medicine, nursing, dentistry, veterinary medicine, the health care system, and the preclinical sciences. It contains bibliographic information from over 3,900 biomedical journals published in the United States and 70 foreign countries, for a total of 9 million records dating back to 1966. The database is updated every week; each month about 33,000 new citations are added.

Using “pharmacy,” “pharmaceutical,” or “pharmacist” in keyword searches on MEDLINE produces 14 titles, including the American Journal of Health-System Pharmacy, the Journal of Clinical Pharmacy and Therapeutics, and the Journal of the American Pharmaceutical Association.

Many users find that modifying a search term even slightly can bring very different results. For example, using “asthma” as a keyword for a MEDLINE subject search articles brought up 2,262 articles. However, if “asthmatic” is used, the search produces only 707 articles. Because no mechanism has yet been established to directly link two terms like this, even a minor difference in phrasing may mean missing an important article.

A remedy for this problem is to make use of NLM’s Medical Subject Headings (MeSH) thesaurus. MeSH indexes articles in NLM databases using a hierarchical system to structure a set of terms or subject headings. You can choose to either broaden or narrow the search terms according to the “tree” structure of the thesaurus, or choose related terms with which to link the tree’s branches. For example, the hierarchical structure of the MeSH term “drug utilization” is:

- N. Health Care
- N4. Health Services Administration
- Organization and Administration
  - Pharmacy Administration
  - Drug Utilization
  - Drug Utilization Review

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Clearly, using MeSH effectively can produce a search result that is comprehensive and consistent. Consequently, the MeSH thesaurus system is now built into all NLM-produced databases, including MEDLINE; users simply input any keyword and then select “find MeSH/meta terms.” The system will respond with a list of suggested search terms. For example, if you type in “asthmatic” as a keyword, and then select “find MeSH/meta terms,” the MeSH suggested list of search terms does indeed include “asthma.”

The MeSH system also provides a “concept” list to help you map a query better. For example, using “disease state management” as a keyword on MEDLINE will return more than 2,000 articles (as of February 10, 1999), only a few directly related to disease state management programs. To tackle this problem one must use a concept as a second search term and once again select “find MeSH/meta terms.” The Internet Grateful Med (an interface of MEDLINE) will provide a list of meta-thesaurus concepts which will include “managed care programs.” Using this phrase as a second search term produces 20 fully relevant articles.

Because MEDLINE has a clinical orientation, false negatives (failure to retrieve relevant articles) and false positives (retrieval of irrelevant articles) could be common in searches for articles related to administration and management. A database such as HealthSTAR that is oriented to health service might be of more use.

HealthSTAR

www.nlm.nih.gov/pubs/factsheets/online_databases.html#healthstar

HealthSTAR is a bibliographic citation database created in 1996 by merging two NLM databases, HEALTH (Health Planning and Administration) and HSTAR (Health Services/Technology Assessment Research).

HealthSTAR contains three million citations from 1975 to the present, both clinical (emphasizing the evaluation of patient outcomes, the effectiveness of procedures, programs, products, services, and processes) and nonclinical (emphasizing health care administration, economics, planning, and policy).

IPA (International Pharmaceutical Abstracts)
wwwovid.com/databases/index.cfm
IPA is the bibliographic database most specific to pharmacy administration and pharmacy service research. Produced by the American Society of Health-System Pharmacists (ASHP), it covers approximately 600 titles (“subjects of drug therapy, toxicity, pharmacy practice, legislation, regulation, technology, utilization, bio-pharmaceutics, information processing, education, economics, and ethics as related to pharmaceutical science and practice”), and contains over 300,000 records from 1970 to the present. JMCP is indexed in IPA.

IPA includes all abstracts from ASHP-annual and midyear clinical and home care meetings, as well as American Pharmaceutical Association (APhA) and American Association of Colleges of Pharmacy (AACP) meetings; articles from state pharmacy journals, and articles that offer continuing education credit. IPA provides numerous references on topics relating to pharmacoconomics and pharmaceutical care. The paper version of the database is updated semi-monthly, and the CD-ROM version is updated monthly.

CINAHL (Cumulative Index to Nursing and Allied Health Literature)
www.cinahl.com
CINAHL is an index database that covers journal articles, dissertations, and other publications in nursing and allied health from 1982 to the present. It indexes some research instruments and provides full text of selected others; a special feature is the collection of nursing standards as well as the state nursing journals.

The database, www.cinahl.com, produced by CINAHL Information Systems, covers over 950 journals in cardiology, pulmonary technology, emergency services, health education, med/lab technology, medical assistance, medical records, occupational therapy, physical therapy, radiological technology, respiratory therapy, social sciences, and surgical technology, with some attention to biomedicine, the behavioral sciences, management, and education. Currently, the database contains over 250,000 records, is updated monthly, and is available in both CD-ROM and online. CINAHL indexes 14 pharmacy and pharmacology-related journals.

EMBASE (Excerpta Medica Database)
www.elsevier.com
EMBASE, the Excerpta Medica database produced by Elsevier Science, indexes literature in biological science, biochemistry, clinical medicine, human medicine, forensic science, pediatrics, pharmacy, pharmacology and drug therapy, pharmacoconomics, psychiatry, public health, biomedical engineering and instrumentation, and environmental science. Its comprehensive treatment of drug-related information makes EMBASE obviously useful for drug-related searches.

EMBASE covers over 3,800 journals from approximately 70 countries; it currently contains over 7 million records, adding more than 400,000 each year. Like the NLM databases, EMBASE uses a thesaurus system, EMTREE, a hierarchically structured, controlled-subject vocabulary, to help users retrieve articles. EMTREE contains more than 39,800 controlled vocabulary terms (21,240 drug terms and 18,630 medical terms) and 120,000 synonyms. The company also produces subsets of EMBASE for specific disciplines. The EMBASE Pharmacoconomics & Disease Management database is devoted to such research areas as health care costs, managed care, pharmacoconomics, economic evaluation, health insurance, quality of life, treatment outcomes, resource management, hospital costs, and practice guidelines. It currently contains more than 138,000 abstracts and citations from the past eight years.

Table of Content Indexes

A bibliographic database is very useful for retrieving information addressing a specific area of interest, for example, asthma disease management. However,
there are times when one might wish to survey journals in a particular field to watch for potentially useful implications or applications or simply in order to keep up with research in that area. For example, a user interested in asthma disease management might want to see what is being published generally in Chest and the Journal of American Health-System Pharmacy. Databases that provide “tables of contents” can be searched by subject for a quick scan of the titles and authors of articles published in each issue of a relevant journal to see which might warrant reading of the abstract or even the full article. Making good use of searchable databases for tables of contents can save time and money.

**Current Contents Life Sciences**

www.isinet.com/prodserv/cc/ccprod.html

Current Contents, published by the Institute for Scientific Information, has seven weekly editions in agriculture, the arts, and others; medical articles are indexed under Life Sciences. Complete bibliographic data for journal articles, reviews, editorials, corrections, and conference proceedings are included, but the database does not provide abstracts. The database is provided in print, CD-ROM, and other media; the print and CD-ROM versions are updated weekly.

Current Contents indexes over 1,370 journals. The keywords “pharmacy” or “pharmaceuticals” retrieved 14 pharmacy-related journals.

**E-mail Service for Tables of Content**

Some Web sites of academic associations and publishers will e-mail tables of contents to subscribers, free of charge. For example, the American Medical Association, www.ama-assn.org will e-mail tables of content for nearly a dozen journals, including JAMA, Archives of Family Medicine, and Archives of Internal Medicine.

The vast majority of journal publishers provide tables of contents and often abstracts online. Sometimes, one can even find online the full text of articles addressing certain key issues.

**Full-Text Articles**

To accommodate the increasing demand for remote access to documents, more and more full-text databases are becoming available online. Several proprietary databases can be accessed both through a local library or the Internet.

**OVID**

www.ovid.com/products.cfm

The OVID Company provides six full-text databases: the Core Biomedical Collection (CBC), Biomedical Collections II (BC2), III (BC3), and IV (BC4), the Mental Health Collection (MHC), and the Nursing Collection (NURC). The CBC contains articles from 1993 to the present, the others articles published after 1995.

The MHC covers 10 journals, each of the other five collections about 20 journals. The only journal that contains the word pharmacy in its title is the American Journal of Health-System Pharmacy in the BC4 database. Interested readers should visit the Web site for a complete list of included journal names and some general information about these full-text databases.

**ABI/Inform**

www.oclc.org/oclc/man/6928fsdb/abi_inform.htm

This database compiled by the UMI Company contains citations from 1,805 periodicals. Articles included relate to business and management and have been published in international professional publications, academic journals, or trade magazines. Full text is available online for selected periodicals.

Using “health” as the keyword in a title search returns some 29 publications with full-text articles in the database. These periodicals include the Health Care Financing Review, the Health Care Management Review, Health Services Research, Hospital & Health Networks, and the Journal of Health Politics, Policy & Law. Drug Topics and Pharmaceutical Executive both provide full-text articles. Its business and management orientation and the full-text articles make this a particularly convenient resource.

**Medscape.com**

Some Web sites that provide information to both consumers and health professionals also provide full-text articles. One is Medscape, which provides the full texts of selected articles from about 60 medical journals and news periodicals, including Drug Benefit Trends, U.S. Pharmacist, and JMCP. Keyword searching is available.

Again, many journal publishers provide full-text articles on their own sites. For example, two years worth of JMCP has been posted on www.amcp.org, with older issues being added as time permits.

**Citation Database**

The Science Citation Index published by the Institute for Scientific Information indexes references (footnotes or bibliographies). What makes the SCI different from other bibliographic databases is its ability to track not only references cited by an article, but also articles that have cited that article. The SCI can be used to discover who is referencing what research and to track the studies published by others in a particular field of interest.

SCI thus allows researchers to track the history or methodology of an idea since its first appearance. How often an article is cited suggests the impact of that article on the field.

The SCI covers approximately 3,500 journals in a broad range of disciplines; it can be found at www.isinet.com/isi/products/citation/sci/index.html. Using “pharmacy” and “pharmaceutical” as keywords retrieved 16 journal names, including the American Journal of Health-System Pharmacy, the Journal of Clinical Pharmacy and Therapeutics, and Pharmacy World & Science.

**Newspapers and Magazines**

The UMI Company has compiled a database that abstracts reports from 32 newspapers, including the New York Times, the Wall Street Journal, and the Washington Post. Though this is obviously useful, the lack of full-text articles is a disadvantage.

UMI also compiles ProQuest, which
Researching Managed Care Pharmacy Using Internet Searches

Pharmacy-Related Journals Covered and Articles Retrieved From Selected Databases, 1990 to February 1999

<table>
<thead>
<tr>
<th></th>
<th>MEDLINE</th>
<th>HealthSTAR</th>
<th>IPA&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Science Citation Index Expanded and Social Science Citation Index</th>
<th>Current Contents Life Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total journals collected</strong></td>
<td>About 3,900</td>
<td>—&lt;sup&gt;b&lt;/sup&gt;</td>
<td>About 650</td>
<td>3,500</td>
<td>1,370</td>
</tr>
<tr>
<td><strong>Journal titles with keywords pharmacy, pharmacist, or pharmaceutical</strong></td>
<td>15</td>
<td>—&lt;sup&gt;b&lt;/sup&gt;</td>
<td>More than 216</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td><strong>Articles with keyword formulary</strong></td>
<td>590</td>
<td>875</td>
<td>1,233</td>
<td>500</td>
<td>—</td>
</tr>
<tr>
<td><strong>Articles with keywords&lt;sup&gt;a&lt;/sup&gt; disease state management</strong></td>
<td>1,467</td>
<td>20,562</td>
<td>90</td>
<td>11</td>
<td>—&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Articles with keywords economic evaluation and pharmacueticals</strong></td>
<td>19</td>
<td>49</td>
<td>9</td>
<td>3</td>
<td>—&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Articles with keywords pharmacy network</strong></td>
<td>46</td>
<td>59</td>
<td>27</td>
<td>2</td>
<td>—&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Articles with keywords quality and pharmacy services</strong></td>
<td>394</td>
<td>245</td>
<td>22</td>
<td>0</td>
<td>—&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>When more than one keyword is used as a search term, the retrieving logic looks to see if the keywords appear in a citation, but not necessarily in the order as inputted by the user or as a specific phrase. Therefore, a user typing disease state management as keywords could retrieve an enormous number of irrelevant articles. Strategies to improve search results are explained in the text.

<sup>b</sup>HealthSTAR collected articles from a variety of sources, and a detailed list of all information sources is not available.

<sup>c</sup>This is only the estimated number of journal listings due to the use of abbreviations; consequently, one may have failed to retrieve some journals in IPA.

<sup>d</sup>Current Contents is a journal-based database, and keyword searches for articles are, therefore, not available.

Note: MEDLINE has the most sophisticated searching mechanism, processing keywords through a set of Automatic Term Mapping functions and matching them against a MeSH translation table, a journals translation table, and a phrase list. Some proprietary databases may match keywords with words in titles, abstracts, or keyword listed in an article in order to retrieve their search results.

Many newspapers provide free access to news at their Web sites. As with any other electronic data, online articles are searchable and can be saved and categorized. Users who find themselves overwhelmed by the enormous number of news articles available may like to try a filtering program.

A free program, PointCast, can be downloaded from www.pointcast.com/?pcnidx. PointCast aggregates news and information from over 700 sources and pushes it over the Internet onto a viewer’s desktop. The long list of channels available includes a variety of sources of global and national news, business and industrial news, federal and state government information, and health care related information. One can tailor these channels to individual needs and interests, or choose to read only a particular section of a single broadcasting channel, for example, only health-related reports on CNN.

Of interest to pharmacists in managed care will be the link to the F-D-C Reports; the summary of current articles from more than 20 journals provided by SilverPlatter Information, Inc.; and the daily news releases from Johns Hopkins University and Health System, the NIH, and Reuters Health Information Services. The program allows access to AHRQ guidelines, and several channels devote themselves almost exclusively to managed care, pharmaceutical industry, legislative, and regulatory matters.

Special Purpose Databases

Many public and private organizations that compile databases covering specific fields of interest put their work on the Internet for public use. The AHRQ (Agency for Healthcare Research and Quality) provides searchable and downloadable clinical practice guidelines (www.ahrq.gov/data) and the CONQUEST database, which is a compilation of clinical performance indicators (www.ahrq.gov/qual/conquest.htm).

The research organization RAND provides a bibliography of health-related research and a search engine for abstracts of RAND publications (www.rand.org).

At the CDC Wonder site (wonder.cdc.gov) CDC has put together some 30 data sets, several of which are searchable bibliographic databases. CBA/CEA (cost benefit/cost effectiveness) provides 3,206 articles retrieved from MEDLARS, CATLINE, and other sources of health policy, planning, and administration literature. CDP
(Chronic Disease Prevention) contains three bibliographic databases. The Health Promotion and Education database may be of most interest to managed care pharmacists, as it contains over 20,000 bibliographic citations and abstracts on disease prevention and health promotion. The MMWR (Morbidity and Mortality Weekly Report) data set contains articles published in MMWR since 1982. Queries can be performed at the CDC Wonder site to find census, morbidity, and mortality data for subgroups of the U.S. population.

The Center for Health Care Strategies is a nonprofit organization affiliated with the Woodrow Wilson School of Public and International Affairs at Princeton University. The Center carries out and promotes research designed to benefit managed care pharmacy and offered practical suggestions for managed care pharmacy topics.

To search for a specific pharmaceutical, some databases allow users to target health articles indexed by MEDLINE in the same query process, there is no need to repeat the query later in MEDLINE itself. Users may, however, sometimes need to consult MEDLINE for background articles, such as those addressing disease biology, pharmacology, or the clinical effects of pharmaceuticals.

For users who need to address general economic or managerial studies, databases include EcoLite, produced by the Journal of Economic Literature, and ABI INFORM. On the other hand, users with a narrower field of interest should look to databases that claim to provide the specific information. For example, EMBASE claims to collect a large number of articles on pharmacoeconomics.

The phrasing of a query term and the search strategy employed can also affect the hit and miss rate of a search. For example, some databases allow users to target searches by placing double quotation marks around the search phrase. If pharmaceutical care is used as a query term in MEDLINE to search for articles published after 1990, 1,760 citations are returned. If “pharmaceutical care” (with double quotation marks) is used, the result is a smaller but markedly more relevant 298 articles.

The problem is worsened when different databases interpret the same query differently. In MEDLINE, the query term disease state management will be interpreted as meaning any articles that have any of those three words appearing in any citation field. As a result, thousands of citations, mostly irrelevant, will be retrieved. If the same term is used to conduct a search on IPA, a much more modest number of articles will be recovered, but they will be much more relevant.

Three simple rules may make database searching more effective for researchers:

- Spend a little time learning about the scope and focus of any database you intend to search.
- Use “force mapping” (double quotes around the phrase) for specific phrases whenever possible.
- Use multiple search terms to refine your query; for example, by adding a concept term from the MeSH thesaurus.

Bearing these three rules in mind will greatly enhance the quality of Internet search results.

Table 1 illustrates the differences between some of the databases discussed and shows how they can be used efficiently across a small sample of pharmacy administration topics.

The problems arising when searching the information retrieval databases concern how to select both the appropriate database and the appropriate search term or strategy. An inappropriate database will have low relevance to the study topic. For example, using pharmaceutical care as keywords in a MEDLINE search for articles published after 1990 will retrieve more than 1,700 articles, but most concern the biological or clinical study of pharmaceuticals. This demonstrates that searching a concept against databases that are not designed to cover it will result in a significant number of false positive hits. Moreover, inappropriate database selection may cause a number of false negatives as well. For example, since the Journal of Health Economics is not indexed in MEDLINE, a MEDLINE search will fail to retrieve any articles from it.

Until an automatic tool is available, it is probably best to use IPA as the starting point for searches relating to managed care pharmacy. For a broader scope, HealthSTAR is also useful to search. Since it allows users to include health articles indexed by MEDLINE in the same query process, there is no need to repeat the query later in MEDLINE itself. Users may, however, sometimes need to consult MEDLINE for background articles, such as those addressing disease biology, pharmacology, or the clinical effects of pharmaceuticals.

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### Conclusion

This article has delineated information retrieval resources to benefit managed care pharmacy and offered practical suggestions for their use.

Information about the health sciences is continually altering and expanding, making it, as a body of knowledge, ever harder to master.¹

In the future, intelligent information filtering systems will help users faced with large volumes of information by automatically retrieving and then filtering updates of relevant new medical information.² These filtering systems will record the online behavior of the user, creating a profile of index terms contained in Web pages noted previously. In essence, information retrieval systems will take into account the user’s dynamically changing criteria of relevance.

### References


### Note

In just the last month (April 2001), the National Library of Medicine has integrated the MEDLINE
A Team Approach to Address Antiretroviral Therapy Adherence Barriers in a Managed Care Organization

OBJECTIVE: A pilot project was designed to utilize the knowledge and skills of pharmacists and social workers/mental health professionals to facilitate readiness and informed decision making to optimize antiretroviral therapy adherence for HIV-positive patients considering or beginning drug therapy.

SETTING: Group Health Cooperative in collaboration with Kaiser Permanente Northwest, both group-model health maintenance organizations (HMOs) in the Pacific Northwest.

DESIGN: The Anti-Retroviral Medication Adherence Program (ARMAP) Team at each site consisted of one pharmacist and one social worker or mental health therapist. Together, the team provided education and psychosocial support to patients contemplating, initiating, or reinitiating antiretrovirals. The focus was on increasing patient knowledge, identifying and addressing adherence barriers, and helping patients cope with lifestyle changes associated with integrating antiretroviral medications into their lives. Specific self-management adherence behaviors and therapy goals were designed individually.

MAIN OUTCOME MEASURES: Adherence as measured by refill data and patient satisfaction. Laboratory values for HIV RNA viral load and CD4+ cell count, self-reported adherence, health status, and provider satisfaction were secondary measures.

RESULTS: Pharmacy refill data and adherence questionnaires showed three-month adherence rates of 83% and 91%, respectively. All patient respondents indicated overall satisfaction with ARMAP. Ninety-two percent reported increased understanding of antiretroviral medications. Ninety-two percent of providers were satisfied with ARMAP.

CONCLUSION: Adherence to antiretrovirals was high for ARMAP participants. Patients and providers were satisfied with ARMAP and were able to better understand readiness to initiate therapy.

KEYWORDS: HIV, antiretrovirals, adherence, patient satisfaction, multidisciplinary team

S uboptimal medication adherence is one of the most difficult and complex problems that health care providers and patients face. Nonadherence has been described for almost every situation that requires medication therapy. The National Pharmaceutical Council’s Task Force for Compliance estimated the economic impact of nonadherence in 1993 alone to be $100 billion dollars in health care and productivity costs. Many studies have attempted to identify predictors of nonadherence, particularly patient personality traits and sociodemographic factors. This would allow health care providers to target adherence-enhancement tools and programs to at-risk patient populations. More recently, nonadherence has been identified as a problem that spans the population and is difficult to predict, indicating that individualized treatment plans taking patients’ preferences, goals, concerns, and circumstances into account may be a more effective approach to improving adherence.

Although personality traits and sociodemographic characteristics may not help clinicians predict adherence, characteristics of the medication regimen, the extent of patient involvement in treatment decisions, and the patient’s perception of support from the health care team have been consistently associated with adherence and should be considered when creating patient care plans. Adherence to care plans and medications also has been found to increase as patients gain knowledge.

Treatment regimens for human immunodeficiency virus (HIV) are complex, usually involving at least three drugs and up to 25 pills daily. Many of the medications must be taken specifically with food or in a fasting state, and at prescribed intervals. Side effects are common, and patients will likely take antiretrovirals for life, factors that have been linked to nonadherence. Overcoming medication-adherence barriers is particularly critical in HIV treatment. Sporadic use of protease inhibitors has been associated with the emergence of drug-resistant strains of HIV. This has significant personal and public health implications. Resistance to one drug may lead to cross-resistance to other drugs in the same class, limiting future treatment options. Multidrug-resistant strains also may be transmissible.

Some practitioners withhold triple-drug therapy in cases in which nonadherence is predicted. Critics of this approach say that it unfairly penalizes patients based on race, mental health status, or substance-abuse history, characteristics that are often
A Team Approach to Address Antiretroviral Therapy Adherence Barriers in a Managed Care Organization

viewed as predictive of nonadherence, despite the lack of consistent evidence in the literature. Preliminary evidence exists that effective therapy is being withheld from certain populations.

Readiness to change health behaviors has been described in the literature and has been used to predict treatment success. The asymptomatic HIV-positive population contemplating the lifestyle changes necessary to initiate antiretroviral therapy has not been well studied. The nonurgent nature of initiating drug therapy in these patients has been described, allowing patient readiness to become a crucial component of the decision to start antiretroviral drug therapy. A major limitation of early aggressive HIV treatment without regard to readiness to adhere is that poor adherence leads to treatment failure. In a study of the link between protease-inhibitor adherence and treatment success, researchers found that while 95% adherence correlated to an 80% success rate (defined as an undetectable plasma HIV RNA level), 80% adherence was associated with a 50% success rate.

Once an individual's state of readiness to begin antiretroviral therapy is understood, regimen-specific barriers to adherence may be addressed. Programs that demonstrate success by enhancing adherence are complex, making it difficult to justify offering only one adherence-enhancement tool to patients and to determine the merits of an individual tool. Essential HIV-specific elements of a treatment plan have been proposed. These include the use of jellybean trials, viral load and T-cell counts, and medication diaries as patient-feedback tools. Other tools that have been used to support adherence include having patients associate pill taking with other activities, reminder timing devices, social supports, and drug-information hotlines.

Program Description

This report describes the Anti-Retroviral Medication Adherence Program (ARMAP) pilot project implemented at Group Health Cooperative (GHC) and Kaiser Permanente Northwest (KPNW). The program's patient and provider acceptability and its association with adherence and disease regression are reported. The program was initiated in order to use the combined knowledge and skills of pharmacists and social workers/mental health professionals to facilitate informed decision making, help patients set realistic goals for adherence through better understanding of personal barriers, and optimize antiretroviral therapy adherence by providing regular follow-up for drug management.

The program was developed in response to issues raised in a consumer focus group on HIV care. A general lack of awareness of the importance of adherence and lack of knowledge about available adherence tools were identified in the focus group.

In preparation for ARMAP, the adherence team members were trained in interview and motivation techniques. A thorough review of adherence issues and current HIV treatment recommendations was provided.

The pilot program was launched in October 1998, and enrollment occurred through February 1999. The ARMAP team at each site consisted of one clinical pharmacist and one social worker (at GHC) or mental health therapist (at KPNW). At GHC, primary care providers located throughout the service region manage HIV-positive patients, while at KPNW HIV-positive patients are treated at a centrally located Immune Deficiency Clinic. Adult patients were eligible for inclusion if they were candidates for antiretroviral therapy and had not been on antiretrovirals in the previous three months.

The ARMAP teams were established to address the educational needs of the providers and patients in order to optimize adherence potential prior to the initiation of therapy. Troubleshooting once therapy has been initiated is the more common approach described in the literature but is less ideal because of the substantial evidence that frequent missed doses, drug holidays, and discontinuation of antiretroviral therapy contribute to drug resistance and more rapid disease progression.

The initial patient consultations were scheduled for 90 minutes. Patients completed personal general information sheets, informed consent forms, and MOS-HIV health status questionnaires, and provided baseline adherence data using a questionnaire developed by Chesney et al. at the University of California, San Francisco. In the initial consultations, patients' perceptions of their illness and therapy were elicited and clarified through discussion that acknowledged patients' feelings in a nonjudgmental manner. Adherence barriers and social supports were identified through direct or open-ended assessment questions about daily routine, employment, use of alcohol or drugs, emotional stability, relationships, living situation, and past experiences with medications. Patients were encouraged to build their social support system, in some cases necessitating discussion of issues of HIV-status disclosure and privacy. Patient education was provided on HIV disease, available medications, side effects, combination therapy, drug resistance, and common adherence problems and strategies. Patients were encouraged to ask questions and express concerns, and an effort was made to respond fully to each of them.

Patients who decided to proceed with antiretroviral therapy initiation were offered a one- to two-week placebo (jellybean) trial that simulated the burden of their potential drug regimens. Other adherence tools were utilized depending on the needs of the individual patient. Motivational counseling was used in some cases, emphasizing the fact that taking antiretrovirals is a way to maintain health rather than to treat illness. Medications were dispensed as one-month supplies to allow for closer monitoring and were cycled together to avoid multiple trips to the pharmacy within the month. Other available tools were HIV calendar medication boxes, pagers, and alarm watches.

Shared decision making was employed to arrive at clinically appropriate, individualized treatment plans for patients who chose to initiate therapy. This process involved the providers, the ARMAP teams, and the patients.

Following initiation of drug therapy, the pharmacist made a
phone call to the patient after three to four days to address problems, concerns, or specific drug side effects. At two to three weeks, the social worker called to provide additional support. A 30-minute visit or phone consultation was scheduled at one and three months to address further concerns and elements of therapy effectiveness. Additional visits were arranged as needed.

To assess the impact of the ARMAP program, the Chesney et al. adherence questionnaire was administered at the one- and three-month visits and the MOS-HIV questionnaire was administered at the three-month visit. Patient and provider satisfaction questionnaires were administered at the end of the study period. Adherence to antiretroviral medication was the primary outcome of interest. Pharmacy refill data and self-reported adherence were used as primary adherence measures. Laboratory values for HIV RNA viral loads and CD4+ cell counts were collected as additional adherence indicators.

Multiple measures of adherence were collected to obtain a more complete picture than could be derived from a single measure. Pharmacy dispensing records do not capture the timing of doses or actual taking of medication; patient reports are subject to inaccuracy because of patients’ inability to remember or unwillingness to report failed drug dosing; HIV viral load and CD4 count are influenced by many factors (e.g., drug absorption, resistance of HIV strain) in addition to adherence.

Practice Innovation

The two characteristics that made this program unique are its focus on determining patients’ readiness to integrate antiretroviral therapy into their daily lives and the coupling of pharmacists and social workers/mental health professionals as adjunct health care teams offering educational and psychosocial support to patients contemplating, beginning, or restarting complex drug regimens.

The ARMAP program was rooted in the belief that waiting to treat is preferable to poor adherence to treatment, and that patients, if provided with adequate information and clarification of the issues associated with antiretroviral therapy, are best able to identify their readiness to start medication. Although the patient was encouraged to determine his or her readiness, dialogue with the ARMAP team was an integral part of this determination. Having a pharmacist and a social worker or mental health professional help the patient with this decision removed the pressure to treat the disease from the prescriber. Although delaying antiretroviral therapy has not been shown to be detrimental to future treatment success, the high visibility of the disease and the political volatility surrounding it contribute to an environment in which physicians may not feel comfortable waiting to treat an identified case of HIV.

Traditionally, social workers and pharmacists have not been paired in the provision of health care, yet they have complementary skills and knowledge to contribute to adherence enhancement. Patients with HIV face unique challenges that pharmacists and mental health professionals are able to address. Among these challenges are quickly changing knowledge about disease pathology and treatment options; the large amount of conflicting information available through the media and other sources; social stigma; the psychological burden of having a chronic and, most likely, terminal disease; the high cost of treatment; and the complexity of the currently preferred treatment regimens.

Results

Thirty-two participants (18 at KPNW and 14 at GHC) were enrolled in the program's pilot phase. The average age of program participants was 39 years, and the majority (31/32, 97%) was male. Five (16%) were nonwhite. Thirty-eight percent of study participants were classified as having acquired immunodeficiency syndrome (AIDS), using the Centers for Disease Control and Prevention classification. While 32 participants entered the study, 26 patients (81%) were eligible for analysis at the one-month follow-up and 23 (72%) went on to complete the entire three-month pilot program, including all questionnaires and medication refill

Pharmacy refill data and self-administered questionnaires were used as measures of adherence for patients who initiated therapy. Seventy-eight percent of participants were “very” or “extremely” sure that they would be able to take all or most of the study medication when asked at baseline. At one month, 26 patients had initiated therapy and completed follow-up questionnaires. Among the six not eligible for analysis at one month, three GHC and one KPNW participant chose not to start antiretroviral therapy. Reasons patients decided not to start included substance abuse, better understanding of disease status and therapy consequences, denial of disease status, and fear of disease disclosure. Two patients dropped out of the study before completing the one-month questionnaire. Seventy-three percent of patients reported taking all their medications in the previous four days. Pharmacy refill data indicated that 88% had filled their prescriptions and had medication available on those four days.

At three months, 23 participants were available for analysis; two were lost to follow-up and one did not complete the self-assessment questionnaire. Ninety-one percent reported taking all of their medications in the previous four days; pharmacy refill data indicated that 83% had medication available.

Almost all study subjects reported that they were able to adhere to their dosing schedules all or most of the time (96% at one month, 95% at three months). A significant proportion (100% at one month, 94% at three months) reported that they were able to follow special instructions, such as “take with food” or “take on an empty stomach.” When asked if they missed any medications the previous weekend, 85% at one month and 90% at three months responded no. The most commonly cited reasons for missing doses were “had a change in my daily routine” and “busy with other things.”
HIV-related lab values were used as additional measures of adherence as well as an adherence encouragement tool. The average baseline CD4+ count for ARMAP participants was 313 cells/mm3. Twenty-three of 24 (96%) participants who began therapy and had a repeat CD4+ count at three months showed an improvement over baseline. The average three-month CD4+ count was 436 cells/mm3. The baseline viral load for ARMAP participants ranged from 967–500,000 copies per milliliter (ml) (median 42,595 copies/ml). All patients initiating therapy experienced a drop in viral load. At one month, three patients achieved undetectable levels of the HIV virus (<50 copies/ml). Eight additional patients reached undetectable levels of virus at three months. The percentage decrease in viral load at three months among patients who started antiretroviral medication ranged from 67% to over 99%, with the majority of patients experiencing a drop of at least 95% from baseline.

Patients participating in ARMAP were satisfied with the program. Table 1, right, shows the distribution of responses to two participant-satisfaction-survey questions. Five-point Likert scales were used to assess both ARMAP’s perceived helpfulness and participants’ overall satisfaction with the program, with 1 corresponding to “very unsatisfied” or “very unhelpful” and 5 corresponding to “very satisfied” or “very helpful.” Although 23 patients completed all questionnaires, 78% of those initially enrolled completed the satisfaction questionnaire. Eighty percent of participants responding to the satisfaction survey reported that the program was “helpful” or “very helpful” for taking their medications. All respondents indicated overall satisfaction with ARMAP. The mean provider rating of the program’s overall usefulness was 4.42, with 92% (11/12) of providers indicating that ARMAP was “useful” or “very useful” to them. The program was most helpful, according to the mean response, with supporting patients on retroviral therapy (mean=4.64). The program was also deemed helpful by providers in reducing the time they spent discussing medications and providing patient education (4.33 and 4.17, respectively). The adherence team’s assessment of readiness to begin therapy and patient follow-up after starting therapy were identified as useful by most providers (mean response=4.42 and 4.58, respectively).

Preliminary analysis of health status via the HIV-MOS instrument at baseline and 12 weeks showed no significant change in health status after initiation of antiretroviral therapy, even after adjusting for adherence. These findings will be reported separately.

**Discussion**

<table>
<thead>
<tr>
<th>Response</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Helpfulness of ARMAP in Medication Taking</strong> (mean=4.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: Very helpful</td>
<td>15</td>
<td>60%</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>3: Somewhat helpful</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>1: Not at all helpful</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Overall Satisfaction with ARMAP</strong> (mean=4.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5: Very satisfied</td>
<td>22</td>
<td>88%</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>12%</td>
</tr>
<tr>
<td>3: Neutral</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>1: Very dissatisfied</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Note: N=25

*One KPNW survey respondent did not answer this question.

<table>
<thead>
<tr>
<th>Reported Benefit</th>
<th>Yes N (%)</th>
<th>No N (%)</th>
<th>Not Applicable N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared and compared experiences with others with similar problems</td>
<td>10 (40)</td>
<td>5 (20)</td>
<td>10 (40)</td>
</tr>
<tr>
<td>Increased my understanding of what antiretroviral medications are and how to take them</td>
<td>23 (92)</td>
<td>1 (4)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Helped me understand whether I was ready to start taking medications</td>
<td>20 (80)</td>
<td>3 (12)</td>
<td>2 (8)</td>
</tr>
<tr>
<td>Made specific changes to better manage my medications</td>
<td>16 (64)</td>
<td>6 (24)</td>
<td>3 (12)</td>
</tr>
<tr>
<td>Learned to identify challenges to taking my medications</td>
<td>21 (84)</td>
<td>3 (12)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Learned to avoid situations that interfere with taking my medications</td>
<td>17 (68)</td>
<td>4 (16)</td>
<td>4 (16)</td>
</tr>
<tr>
<td>Improved my ability to be successful with medication taking</td>
<td>22 (88)</td>
<td>2 (8)</td>
<td>1 (4)</td>
</tr>
</tbody>
</table>

Note: N=25.
The major limitation of this pilot study was that no control group was included, which makes it difficult to attribute the high adherence rates solely to the team's interventions. The high adherence rates may also be attributable to patient knowledge of adherence monitoring or to the fact that participants were a self-selected group that may have been more likely to adhere and be receptive to the team's interventions than the general HIV-positive population would be. Adherence rates to most medications also have been shown to decrease with duration of therapy, so the adherence rates in this three-month pilot cannot be extrapolated.14 The reasons for the shift from higher patient-reported rates of nonadherence compared to pharmacy refill data at one month to lower rates of patient-reported nonadherence at three months are unclear. Patients' clearer understanding of the survey instrument or less attention to missed doses over time may have played a role.

The project's initial success has led to its extension in both organizations, and six- and nine-month data will soon be available, allowing us to examine potential concurrent control groups.

Conclusions

The ARMAP pilot was well received by both patients and providers and has proven successful in supporting adherence, contributing to an improved state of readiness to start medications and positive clinical outcomes. Patient readiness to start antiretroviral medication was more clearly understood by patients, physicians, and the ARMAP team as a result of the closer collaboration. High adherence rates to newly initiated antiretrovirals were documented, and no decline in health status was noted in these patients.

The successful collaboration between allied health professionals and prescribers in this program may serve as a prototype for future collaborations intended to improve clinical outcomes in ambulatory populations. As more time demands are placed on prescribers and conflicting health and drug information is made available to the public, allied health professionals are in a good position to support prescribers by helping patients with chronic diseases to understand how medications and behaviors may affect their health.

References

An Employee Influenza Immunization Initiative in a Large University Managed Care Setting

**Objective:** To implement an employee influenza-immunization initiative, assess employee population characteristics, and estimate the cost savings to the university and its managed health care system.

**Design:** An interdisciplinary team of health care providers vaccinated employees at mobile sites. A survey was distributed to assess population factors and flu-vaccine status of employees. A literature-based economic analysis was conducted to estimate savings.

**Setting:** Large university campus with a major medical center.

**Main Outcome Measures:** Total number of employees vaccinated compared to prior years, employee population characteristics, and estimated cost savings (direct and indirect costs).

**Results:** The immunization effort reached 5,730 employees on the main campus, an increase of more than 2,000 employees from the previous year. Of employees completing an on-site survey, nearly 30% were first-time influenza vaccine recipients and 85.5% were enrolled in one of the university health plans. The direct cost for the initiative was approximately $25,000 while the estimated cost savings approached $400,000.

**Conclusion:** The focused influenza immunization initiative increased numbers of employees vaccinated on campus. Survey results provided a description of the employees vaccinated. The employer-driven program was predicted to provide cost savings.

**Keywords:** Influenza, vaccination, managed care, vaccination history of the vaccinated population were assessed.

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**Authors**

Jeri J. Sias, Stephanie Cook, Thomas Wolfe, Gavin Baumgardner, and Pam Salsberry

Influenza and pneumonia, combined, represent the sixth leading cause of death in the United States. Hospitalizations attributable to influenza and pneumonia number over 100,000 each year. Additionally, influenza accounts for an average of 20,000 deaths annually. Influenza can cause significant morbidity and mortality in elderly patients and in persons of any age with chronic medical conditions. In addition to the impact of influenza in these high-risk groups, the average healthy working adult is also adversely affected socially and economically. Influenza outbreaks have far-reaching consequences. Communities as a whole can benefit from innovative approaches to decrease the prevalence of future outbreaks.

The National Vaccine Advisory Committee, recognizing the need for improved rates of adult vaccination, has evaluated nontraditional settings for adult immunization, including the workplace and pharmacies. While current influenza vaccination recommendations target specific age and high-risk groups, the need and benefit for vaccination in healthy working adults remains less clear. According to Nichol et al., influenza vaccination of healthy, working adults has positive health-related and economic outcomes. In their evaluation, the estimated sick leave per year attributable to upper respiratory illness was approximately 1.22 days for nonvaccinated, healthy, working adults, compared with 0.7 days for vaccinated adults (0.52 sick days saved per employee per year). Additionally, their study focused on the potential economic benefits to employers by evaluating direct and indirect costs of vaccinating employees.

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**Objective**

This descriptive report outlines a worksite influenza-vaccination initiative delivered by an interdisciplinary team. The major emphasis of this initiative was to increase influenza-vaccination rates among university employees by providing convenient and accessible services. Characteristics and influenza-immunization history of the vaccinated population were assessed. Potential cost savings to the university and its managed health care system were evaluated by applying a literature-based model.

**Practice Description/Setting**

The Ohio State University (OSU) has approximately 24,500 employees. The OSU Managed Health Care System, Inc. (MHCS), the principal health care provider to employees in the
An Employee Influenza Immunization Initiative in a Large University Managed Care Setting

The university, has a history of working to improve access to wellness care through mobile sites. Health-risk assessments by an interdisciplinary team of nurses, pharmacists, and health educators are provided to all employees as a university benefit. Additionally, the university's managed health plans have contracted with the outpatient pharmacy to provide cholesterol-management and smoking-cessation services.

Traditional sites for influenza vaccinations have included the employee health center, mobile campus sites, and physicians' offices. For the 1997–98 and 1998–99 influenza seasons, the estimated number of influenza vaccinations provided in these sites on the main campus was 2,070 and 3,230, respectively (see Figure 1, below). Based on the number of past influenza vaccines on campus, the history of interdisciplinary care in mobile sites, and a literature-based assessment of influenza-vaccination benefits among working adults, OSU MHCS, Inc., recognized the need to improve influenza-vaccination rates. The health plan made a commitment to provide accessible influenza-immunization services to campus employees. An interdisciplinary team of health care providers was used to create additional sites around campus.

Practice Innovation

The university managed health care system partnered with the employee health center, the faculty and staff wellness program, the college of pharmacy, and the office of human resources to provide an influenza-immunization initiative. Between October and December of 1999, influenza immunizations were provided at no cost to employees at 25 sites around campus. Mobile sites were interspersed throughout the campus to be accessible to most of the university employee population. At most sites, immunizations were given over a four-hour period of time. The interdisciplinary team included pharmacists, nurses, a nurse practitioner, a physician, and a health educator. Physicians' offices also continued to offer influenza-vaccination services.

To encourage employee participation, the program was marketed through campus-newspaper advertisements, individual e-mail messages, and an Internet sign-up/appointment model. Individuals were recruited from departments throughout campus to reserve rooms for vaccination and communicate with departments in or near their mobile site. E-mail messages offering Internet scheduling were sent to employees to encourage their participation. The secured Internet site was developed to facilitate employee sign-up and to help anticipate the number of vaccinations that would be provided on each day. After scheduling by Internet, employees received an e-mail reminder of the date and location for vaccination. Maps highlighting building sites for the immunization initiative were distributed in the campus newspaper.

Educational materials on the influenza vaccine and other adult immunizations were made available to employees while they waited for vaccination. Employees were asked immunization-screening questions at registration sites by each provider. While vaccines were prepared, patients completed consent forms. Adult-immunization record cards and a survey tool to assess patient characteristics and vaccination history were also distributed to employees.

Main Outcome Measures

To assess the effectiveness and population characteristics of the influenza immunization initiative, data were collected and evaluated on employees vaccinated and surveyed. The total number of university employees who were vaccinated was tabulated based on sign-in records at each site and through physician office International Classification of Disease, 9th edition (ICD-9) codes. After the initiative was completed in December 1999, vaccine recipients were matched to university employment records to obtain demographic information and employment data.

The survey was distributed only at main campus mobile sites and the employee health center. It assessed the employee’s health plan enrollment and influenza-vaccination history, and asked their opinion of the convenience of the vaccination program. Survey results in the employee health center and at mobile sites were compared using a chi-square test (SAS).

Using the employment data, the average salary, including benefits, was calculated. To determine the potential reduction in the number of sick days and the potential cost savings to the university and the managed health care system, the direct and indirect costs were estimated according to the Nichol model.4 In this model, medical care costs were estimated based on the mean fee in 1994 for a physician's office visit for an established patient. They estimated half of employees experiencing side.

<table>
<thead>
<tr>
<th>Number of Employees Vaccinated on Main Campus by Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,070*</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1,500</td>
</tr>
<tr>
<td>3,000</td>
</tr>
<tr>
<td>4,500</td>
</tr>
<tr>
<td>6,000</td>
</tr>
</tbody>
</table>
An Employee Influenza Immunization Initiative in a Large University Managed Care Setting

**Results**

In the 1999–2000 influenza season, a total of 6,624 employees were documented as being vaccinated by university providers (employee health, mobile units, and physician offices) at the main campus and regional campus sites. Of those employees, 5,730 were vaccinated on the main campus of the university (mobile sites/employee health: 5,081; physician offices: 649). This initiative increased vaccinations on the main campus by more than 2,000 and 3,000 vaccines compared to the two prior vaccine seasons (see Figure 1, page 220).

Only the employees vaccinated in employee health (n=1,167) or at a mobile site (n=3,914) on the main campus were analyzed (total n=5,081). Nearly 86% (4,358/5,081) of vaccinated employees were matched to human-resource files and had available demographic data (see Table 1, left). While there were 24,554 employees during the initiative, 17,837 were considered both benefits-eligible and worked on the main campus. Of these benefits-eligible main campus employees, 24.4% (4,358/17,837) were vaccinated.

The total survey response rate was 60% (3,045/5,081). Ninety-eight percent of respondents reported having health insurance, with 85.5% indicating enrollment in one of the four university health plans. Employees who reported that this was their first influenza vaccination totaled 29.4%. Forty-six percent of the surveyed employees reported that they did not get a flu shot last year. Convenience was cited as influential in receiving their vaccine in 93.2% of employees (see Table 2, left).

Survey return rates varied in the employee health center (22%: 257/1,167) compared with mobile sites (71.2%: 2,788/3,914). First-time vaccine recipients seemed to be more likely to use a mobile unit than the employee health center (mobile: 30.1%, employee health: 21.8%, p=0.005). These results suggest that the convenience offered by mobile sites enhanced immunization rates (mobile: 94.5%, employee health: 90.6%, p=0.011) (see Table 3, page 222).

An economic analysis was conducted using the model described by Nichol et al. The direct cost for the immunization initiative was $24,700. The average hourly wage plus benefits for participants was $25.61. When applying the Nichol model to the vaccinated population (n=5,081), 2,242 sick days were projected to be saved for the year. The estimated total cost-savings of vaccinating employees was $393,371 (see Table 4, page 222). This amount suggests savings of $90.26 ($393,371/4,358) per employee vaccinated.

**Discussion**

The findings from this project demonstrate benefits of a targeted worksite vaccination program. A total of 5,730 patients were vaccinated during the 1999–2000 season on the main campus, reflecting an increase in immunizations over the two previous

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**Employee Demographics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Vaccinated Population n=4,358</th>
<th>Total University Employees n=24,554</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>44.8</td>
<td>44</td>
</tr>
<tr>
<td>Female (%)</td>
<td>58.4</td>
<td>49.5</td>
</tr>
<tr>
<td><strong>Job Classification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative/professional (%)</td>
<td>2,055 (47.2)</td>
<td>12,601 (51.3)</td>
</tr>
<tr>
<td>Classified civil service (%)</td>
<td>1,263 (29.0)</td>
<td>5,278 (21.5)</td>
</tr>
<tr>
<td>Faculty (%)</td>
<td>1,040 (23.9)</td>
<td>6,675 (27.2)</td>
</tr>
</tbody>
</table>

*Represents the number of patients who have demographic information available through employment records.

---

**Survey Results (n=3,045)**

<table>
<thead>
<tr>
<th>Survey Question</th>
<th>Response</th>
<th>Numbera</th>
<th>Percenta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have health insurance?</td>
<td>Yes</td>
<td>2,993</td>
<td>98.3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>44</td>
<td>1.4</td>
</tr>
<tr>
<td>Do you have university health insurance?</td>
<td>Yes</td>
<td>2,604</td>
<td>85.5</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>435</td>
<td>14.3</td>
</tr>
<tr>
<td>Is this your first time receiving a flu vaccine?</td>
<td>Yes</td>
<td>895</td>
<td>29.4</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>2,148</td>
<td>70.5</td>
</tr>
<tr>
<td>Did you get a flu vaccine last year?</td>
<td>Yes</td>
<td>1,634</td>
<td>53.7</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>1,403</td>
<td>46.1</td>
</tr>
<tr>
<td>Did convenience influence you to get your flu shot at this site?</td>
<td>Yes</td>
<td>2,838</td>
<td>93.2</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>177</td>
<td>5.8</td>
</tr>
</tbody>
</table>

*Numbers may not total 3,045 (100%) because of lack of response on some surveys.

effects would see a physician and that an estimated two days of work were lost per 100 vaccines due to side effects. The numbers of sick days (52 days/100 subjects) and physician office visits (24 visits/100 subjects) avoided due to upper respiratory illness were calculated as a difference in the rates between placebo and vaccine group.

The direct costs for this university initiative included program costs (advertisement, Internet start-up costs, providers, and vaccine/supplies) and estimated direct costs (medical care for side effects and medical care avoided). Indirect costs included the salary loss of one hour away from work for vaccination in addition to estimates of work loss due to side effects and work loss avoided as compared to nonvaccinated employees.
seasons. At the time of analysis, 4,358 of the 5,081 participants in the mobile sites could be verified in the employer records. These matched records were later used to evaluate population demographics and to calculate potential cost-savings for the employer.

The surveys (3,045) provided additional background information about the vaccinated employees that could not be obtained from employee or medical records alone. Almost half (46%) of employees completing a survey did not receive a vaccination in the previous year, and 85.5% were enrolled in one of the university health plans. Results demonstrated that nearly 30% were first-time influenza vaccine recipients. Convenient access via mobile sites appeared to positively affect immunization rates.

The discrepancy observed in survey response rate between employee health (21.9%) and the mobile sites (71.2%) may be attributed to inconsistencies in survey distribution. The demographics and survey answers in employee health compared with mobile sites do suggest some differences and trends. It appears that more first-time flu vaccine recipients received their inoculations at mobile sites than in employee health centers. Employees receiving vaccines at mobile campus units reported convenience as a factor slightly more often than those who visited employee health centers.

The Ohio State University is self-insured (i.e., funds its own health plan). With 85.5% of surveyed participants enrolled in one of the university health plans, OSU MHCS, Inc., and the university, as an employer, both benefit from high participation in the initiative. To determine potential cost savings, a literature-based analysis by Nichol et al. was utilized.\(^4\) In this randomized, double-blind, placebo-controlled trial of influenza vaccination in 849 healthy, working adults in the Minneapolis–St. Paul region, an economic model of direct and indirect costs was developed.

In applying this model to this university’s findings, a direct cost savings of $58,545 and an indirect cost savings of $334,826 were projected. The cost for medical care office visits in the Nichol study was adjusted to the 1999 Consumer Price Index.\(^5\) To determine potential work lost, the average university employee salary including benefits was used. In this setting, a more conservative time (1 hour instead of 30 minutes) was used to determine time away from work.

The Nichol study population (n=424) compares to this university’s vaccinated population (4,358) in the following ways: Average age in the university population was 44.8 years in contrast to 39.2 years in the Nichol study. The proportion of female recipients was comparable between the university (58.4%) and the Nichol study (60.2%). Thirty percent of the university employees completing surveys reported first-time influenza vaccination compared with 74% in the Nichol study. We used the Nichol economic analysis as a guide for the potential benefits in the university setting.

### Table 3
Comparison of Survey Responses of Patients Receiving Flu Vaccine

<table>
<thead>
<tr>
<th>Variable</th>
<th>Employee Health</th>
<th>Mobile Unit</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female (%)</td>
<td>151 (63.4)</td>
<td>1,486 (58.0)</td>
<td>0.1</td>
</tr>
<tr>
<td>n=238</td>
<td>n=2,546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First-time influenza vaccination (%)</td>
<td>56 (21.8)</td>
<td>839 (30.1)</td>
<td>0.005</td>
</tr>
<tr>
<td>n=257</td>
<td>n=2,786</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience as a factor in getting flu vaccination (%)</td>
<td>230 (90.6)</td>
<td>2,608 (94.5)</td>
<td>0.011</td>
</tr>
<tr>
<td>n=254</td>
<td>n=2,761</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Total Employee Health responses (n=257), Total Mobile Unit Responses (n=2,788)

### Table 4
Economic Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cost (Savings) n=4,358</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct costs</strong></td>
<td></td>
</tr>
<tr>
<td>Vaccination program costs(^a)</td>
<td>$24,700</td>
</tr>
<tr>
<td>Medical care for side effects (1 office visit per 100 subjects)(^b)</td>
<td>$3,619</td>
</tr>
<tr>
<td>Medical care avoided (24 office visits for upper respiratory illness per 100 subjects)(^c)</td>
<td>($86,864)</td>
</tr>
<tr>
<td>Total direct costs</td>
<td>($58,545)</td>
</tr>
<tr>
<td><strong>Indirect costs</strong></td>
<td></td>
</tr>
<tr>
<td>Work time lost for vaccination (1 hour per vaccination)(^d)</td>
<td>$111,608</td>
</tr>
<tr>
<td>Work loss due to side effects (2 days per 100 subjects)</td>
<td>$17,857</td>
</tr>
<tr>
<td>Work loss avoided (52 days for upper respiratory illness per 100 subjects)</td>
<td>($464,291)</td>
</tr>
<tr>
<td>Total indirect costs</td>
<td>($334,826)</td>
</tr>
<tr>
<td><strong>Net costs</strong></td>
<td>($393,371)</td>
</tr>
</tbody>
</table>

\(^a\)Included costs for advertisement, personnel, vaccine/supplies, and Internet start-up.

\(^b\)Cost for physician visit derived from Nichol et al.\(^4\) ($69.51) and adjusted for inflation ($83.05/visit).\(^5\)

\(^c\)Cost of work loss was determined by averaging the salaries (hourly wage + benefits) based on job classification benefits ($25.61/hour, $204.88/eight hour day).
We believe that all of the estimated values reflect conservative numbers and the potential savings are possibly greater than those reported. Further analysis of vaccinated employees in high-risk categories (e.g., persons with diabetes or asthma) compared with a control group should also be conducted.

**Conclusion**

This interdisciplinary initiative was successful in increasing influenza immunizations during the 1999–2000 influenza season. Approximately one-third of employees indicated that they had never before received a flu vaccine, and more than 90% cited convenience as influential in receiving a vaccine. It is possible that access and convenience to vaccine services increased vaccination rates.

Based on the literature, the potential cost savings to the university and managed health care systems was nearly $400,000, or approximately $90 per employee. In addition, the university community was estimated to save more than 2,000 sick days. These interdisciplinary immunization efforts could prove to be viable partnerships in other settings as well. Such partnerships could benefit employees, employers, and the health care system, leading to decreased sick days and increased cost savings to the community.

**References**

A Cost Analysis of Four Benefit Strategies for Managing a Cox II Inhibitor

by Gregory Tucker, Andrea Moore, Deborah Avant, and Merlyn Monteiro

Traditional pain and arthritis medications, known as nonsteroidal anti-inflammatory agents (NSAIDs), inhibit the enzymes Cox I and Cox II. Cox I assists in the regulation of normal body processes, whereas Cox II is believed to play a role in pain and inflammation. Celecoxib was the first drug of its type to target only Cox II, and is available in 100 and 200 mg capsules. For osteoarthritis, 100 mg is given twice a day, and for rheumatoid arthritis, up to 200 mg twice a day is prescribed. Celecoxib also was the first agent approved as an adjunct to usual care for familial adenomatous polyposis. The dose for familial adenomatous polyposis is 400 mg twice a day.¹

Since its release in early 1999, celecoxib (branded as Celebrex) has become one of the most frequently prescribed medications for arthritis. Another Cox II inhibitor, Viox, is also indicated for the relief of chronic pain, stiffness, and inflammation associated with osteoarthritis; however, celecoxib was chosen for this study (conducted February–December 1999) because it was the first Cox II inhibitor available, had a more extensive list of chronic indications, and was more prevalent on managed care formularies.

Celecoxib is an expensive medication and has the potential for misuse and/or overuse. With the availability of other therapeutic options, many pharmacy benefit plans have chosen to place restrictions on celecoxib. Figure 1, page 225, shows a comparison of the cost per day of celecoxib therapy in relation to the daily cost of treatment with other NSAIDs.²

This study examines the impact of celecoxib from the perspective of a pharmacy benefit management company (PBM), Advance Paradigm (API, now AdvancePCS). Many of the clients served by API, including those whose data were examined in this study, do not operate their own internal pharmacy departments and base their pharmacy benefit decisions on API's clinical expertise.

The objective of this study was to evaluate the impact of four benefit strategies on celecoxib utilization and to determine which was the most effective in ensuring appropriate use of this product. The major outcome measure was to report which of the following cost-containment programs resulted in the most significant cost savings to the plan:
• requirement of a prior authorization in which the member's claim for celecoxib was previously rejected;
• contingent (step) therapy, in which other alternatives were
A Cost Analysis of Four Benefit Strategies for Managing a Cox II Inhibitor

tried and failed before celecoxib was used;
• a therapeutic buy-up program, in which a maximum allowable cost is implemented with the member paying the difference; or
• a three-tiered copayment plan, in which celecoxib is placed in the highest tier with other nonformulary medications.

Methods
Reports showing paid claims were run using the Apothequery prescription data software, a patented API product. These reports, which contained data from four of API’s clients, showed each claim processed, information about patient copayments, days supply, quantity dispensed, ingredient costs paid, the date each prescription was filled, and medication strength. For claims that were denied and never subsequently paid, requests were submitted to the information technology department for retrieval of these data. Claims that were submitted and subsequently reversed were “scrubbed” and discarded. Corresponding data reports were manipulated using Excel spreadsheet software when necessary. The four clients examined varied in size, demographics, and benefit design.

Data from a 36,000-member indemnity plan that uses a three-tiered copayment program were gathered and examined. The lowest tier, corresponding to generic drugs, requires a $7 copayment. Preferred brand-name drugs, the second tier, require a $15 copayment. Celecoxib is placed on the third tier, nonpreferred brand-name drugs, which requires a $25 copayment. This type of program discourages use of nonpreferred drugs, but allows the patient access to the medication if he or she is willing to pay the price.

Using Excel software, all $25 copayments were changed to $15, thus showing a theoretical total copayment and a theoretical total amount paid had the third tier not been implemented. The difference between the theoretical amount paid and the actual amount paid was determined, and a percentage of savings was calculated. The three-tier copayment saves this plan 17.1% compared to the amount that would have been paid had the third tier not been implemented.

Data from a 142,000-member group with a therapeutic buy-up plan were gathered and examined. In this type of plan, the insurer selects a limited number of preferred products in a given therapeutic class. The member pays the difference between the cost of the nonpreferred product and the preferred product, plus the appropriate copayment. In order for a member to receive celecoxib, a nonpreferred product, the member must pay a $20 copayment plus the difference of the cost of the medication, using generic naproxen as the comparison. Again, this discourages use of the drug, but allows access to patients willing to pay the price.

Using Excel software, all copayments greater than $20 were normalized to $20, resulting in a theoretical total copayment and a theoretical total amount paid had the use of celecoxib not been restricted. The difference between the theoretical amount paid and the actual amount paid was determined, and a percentage of savings was calculated. The therapeutic buy-up program saves this plan 36.7% over what the plan would have paid if no restrictions were implemented.

Claims data were examined from a 46,000-member group that uses a prior-authorization program to control the use of celecoxib. In this type of program, pharmacists are trained in specific disease states and their appropriate treatments. They are responsible for determining whether celecoxib is being prescribed appropriately according to guidelines set by the plan, and approve or deny submitted claims accordingly. The prior-authorization requirements do not specify a diagnosis; however, they do outline specific screening criteria for patients who should not be on NSAIDs, based on factors such as increased age, risk of GI bleeding, use of anticoagulants, and previous intolerance to other NSAIDs. Data for appeals were not available or tracked by API.

Under this plan, celecoxib may be used by patients who:
• are older than 65;
A Cost Analysis of Four Benefit Strategies for Managing a Cox II Inhibitor

<table>
<thead>
<tr>
<th>Benefit Strategy Comparisons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cost-Containment Program (Number of Claims)</strong></td>
</tr>
<tr>
<td>Step therapy (138)</td>
</tr>
<tr>
<td>Prior authorization (879)</td>
</tr>
</tbody>
</table>

| **Cost-Containment Program (Number of Claims)** | **Amount Paid** | **Copayment** | **Days Supply** | **Quantity** | **Ingredient Cost Paid** | **New Copayment** | **New Paid** | **% Savings** |
| Therapeutic buy-up (8,989) | $412,368.55 | $385,887.39 | 296,883 | 415,421 | $775,304.44 | $145,813.75 | $652,442.19 | 36.18 |
| Three-tier co-payment (505) | $23,019.98 | $12,426.25 | 13,480 | 17,925 | $34,301.91 | $7,695.00 | $27,751.23 | 17.10 |

- have prior documentation of GI ulcer;
- are concurrently treated with corticosteroids or anticoagulants;
- have used an H₂ blocker or proton pump inhibitor;
- are smokers or alcohol abusers; and/or
- have tried and demonstrated intolerance of at least two other NSAIDS.

A comparison was made between celecoxib claims that were paid and those claims that were submitted but denied payment. The cost per unit of therapy (capsule) was calculated by dividing the total amount paid by the plan by the total number of capsules dispensed. A listing of all celecoxib claims that were ultimately rejected was obtained, and the total number of capsules that were not dispensed was also calculated. Using the cost per capsule, cost savings were determined. The cost savings were then compared with the potential total amount paid (paid claims plus rejected claims). The total savings was 49.8%.

The final group studied is a plan with 13,000 lives that has implemented a step-therapy program. Step therapy is similar to prior authorization; predetermined requirements are established and the computer system will automatically pay the submitted claim if, within the previous 90 days, the patient has used at least one of the following for 30 days:
- Cox II inhibitor or NSAID;
- H₂ antagonist, proton pump inhibitor, Cytotec (prostaglandin), sucralfate;
- anticoagulant/antiplatelet therapy; or
- 10 days of combination ulcer treatment (i.e., PreoPac).

As with prior authorization, a comparison was made between all paid celecoxib claims and all celecoxib claims that were submitted but denied payment. A total for all submitted celecoxib claims, regardless of final payment status, was determined. The percentage of savings was calculated to be 74.1%. Step therapy is the program that realizes the largest percentage in cost savings of the plans examined (see Table 1, above).

**Limitations**

Certain inherent limitations and assumptions must be addressed concerning this analysis and the methods used. Ideally, data for such an analysis would be collected over a two-year period. Celecoxib was released during the first quarter of 1999; therefore, only several months’ (February–December 1999) worth of data could be examined.

The software used to obtain claims data, Apothequery, has two main limitations that must be considered. First, integration of the program with other software is difficult, and at the time this article was written, the database was updated only every 30 days. The software used to manipulate and examine the data is limited in the number of records it will hold at one time, lead-
A Cost Analysis of Four Benefit Strategies for Managing a Cox II Inhibitor

Regarding additional steps in the data-examination process. Such piecemeal examination of the data allows for an increased margin of error in calculations. A fairly thorough knowledge of the syntax of the software is necessary in order to perform the necessary statistical manipulations of the data. Assumptions were made that the data received were accurate and correct, and that celecoxib was being prescribed correctly (i.e., for indications discussed previously, and not for chronic pain).

Administrative fees and transmission costs were not included due to their variability from plan to plan. Differences in demographics among patient populations were not considered. The focus of this study was to determine which benefit design was the most cost-effective; however, because of the lack of availability of diagnostic information, cost differences between dosages had to be omitted.

Certain biases must be addressed from the perspective of the PBM. These companies, like any other for-profit organizations, must make money in order to succeed. PBMs are faced with the challenge of reducing drug costs for their clients while maintaining a high standard of care for their clients’ members. PBMs must negotiate with pharmaceutical manufacturers to keep medication costs as low as possible, while keeping the patient’s best interest as their top priority.

Step therapy shows the biggest cost savings to a plan; however, the actual amount of this savings may be over-inflated because of the small size of the plan used as an example.

Conclusion

Since its release in early 1999, celecoxib has become one of the most widely prescribed drugs for arthritis, and has since been awarded the additional indication of familial adenomatous polyposis. Celecoxib was the first member of the new class of drugs known as Cox II inhibitors, and was marketed as a drug that would reduce GI effects that other NSAIDs cause.

Many PBMs and health benefit plans have addressed the high cost and potential for misuse of celecoxib and have placed restrictions on its use by implementing various methods of control. Despite the limitations mentioned, it can be concluded that step therapy provides a plan the greatest amount of cost avoidance because it is the most restrictive of the cost savings measures examined.

References
OBJECTIVE: High exposure to glucocorticoid drugs is associated with an increased risk of osteoporosis and fracture. To define the degree to which individual prescribers needed to adjust their prescribing practices and thus to prevent glucocorticoid-induced osteoporosis among their patients, this research sought to identify both the health plan members who had high exposure to glucocorticoid drugs and the physicians who prescribed these drugs.

DESIGN: Patient demographic characteristics, diagnoses, and medications were determined for members of the Kaiser Foundation Health Plan of Northern California who received more than two grams of prednisone (or its equivalent) during any 12-month period from 1998 through 1999.

RESULTS: High exposure to glucocorticoid drugs was identified in 22,444 health plan members, accounting for about 1% of adult health plan members. High exposure to glucocorticoid drugs increased sixfold from about 0.5% in members 20–30 years old to about 3% in members 70–79 years old; among these members, 3,788 physicians prescribed the glucocorticoid drugs that led to high exposure. The highest numbers of highly exposed patients were seen among rheumatologists and oncologists. Nephrologists, pulmonologists, and gastroenterologists had an intermediate number of highly exposed patients. Internists had the lowest number of highly exposed patients per physician, yet prescribed glucocorticoid drugs to the largest group (40%) of highly exposed patients in the study.

CONCLUSIONS: Using a pharmacy database system developed to identify patients exposed to potentially harmful amounts of glucocorticoid drugs, we identified high glucocorticoid exposure in 1%-3% of health plan members more than 50 years old. In addition, grouping prescribing physicians by medical specialty showed that the need to adjust prescribing practices to prevent glucocorticoid-related complications was unevenly distributed among specialty groups. To improve quality of care for patients in managed care organizations who have high exposure to glucocorticoid drugs, systems for preventive identification and intervention should be developed using pharmacy databases, and should be tailored to physician specialty.

KEYWORDS: Glucocorticoids, menopause, osteoporosis

J Managed Care Pharm 2001: 228–32

Who Bears Responsibility for Glucocorticoid-Exposed Patients in a Large Health Maintenance Organization?

by Bruce Ettinger, Alice Pressman, and Hema A. Shah

Prolonged exposure to high levels of glucocorticoid drugs can cause bone loss, osteoporosis, and fracture.1,2 Fracture ultimately occurs in about half of patients who take glucocorticoid drugs to control pulmonary, rheumatologic, autoimmune, hematopoietic, and gastrointestinal disease.3 About 18 million patients in the United States receive treatment with exogenous steroid agents, and an estimated 0.4% of one U.S. health plan’s members are exposed to glucocorticoid drugs.3,4

Intervention for persons with high exposure to glucocorticoid drugs has been recommended by various medical specialty groups, such as the American College of Rheumatology, the United Kingdom Task Force, and the British Society for Gastroenterology.5-7 In the recent past, approval of bisphosphonates for prevention of glucocorticoid-induced bone loss has spurred interest in this disorder.8-10 However, the process of identifying persons with high exposure to glucocorticoid drugs has not been standardized, partly because glucocorticoid drugs are available in many formulations and doses and partly because the usual practice is to change dosage frequently or to prescribe intermittent use. Thus, only a few patients in U.S. health plans who are at risk for glucocorticoid-induced osteoporosis receive drug prophylaxis to both prevent bone loss and reduce the risk of fracture.4,11

At Kaiser Foundation Health Plan of Northern California, a health maintenance organization (HMO) caring for approximately three million members, databases allow monitoring of all prescriptions and clinic visits. Using these databases, we identified and characterized members who had high exposure to glucocorticoid drugs to determine the care requirements they present to health care providers.

Methods

The study protocol was approved by the Kaiser Permanente Northern California Institutional Review Board. Using the health plan’s computerized pharmacy database (Pharmacy Information Monitoring Service [PIMS]) for the years 1998–1999, we identified prescriptions for 248 different drug items (National Drug Codes) within the oral glucocorticoid therapeutic class. Because glucocorticoid drugs are prescribed as physiologic replacement in patients diagnosed with adrenal or pituitary insufficiency, we excluded from the study 288 such cases on the basis of their outpatient diagnostic codes.

We converted all glucocorticoid values to prednisone equiv-
alents because prednisone was the glucocorticoid drug most commonly prescribed. We used standard weighting factors based on these glucocorticoid drugs' antiinflammatory effects (see Table 1, right). We then applied an algorithm that measured grams of prednisone equivalent prescribed during any consecutive 12-month period beginning in January 1998 and ending in December 1999. Patients older than 20 years who received more than two grams of glucocorticoid drugs in any 12-month period were defined as having high exposure to glucocorticoid drugs. Prescriptions for prednisone (148,568 prescriptions) and dexamethasone (12,611 prescriptions) accounted for 95% of glucocorticoid drug prescriptions issued to adult patients who had high exposure to this class of drugs (see Table 1).

During the study interval, any health care practitioner who was the first to prescribe a glucocorticoid drug to a patient with high exposure to these drugs was designated as responsible for its use; this prescriber's specialty was determined from the health plan's resource directory and from the prescriber's U.S. Drug Enforcement Agency (DEA) license number. When possible, on the basis of each outpatient visit diagnosis, we identified one of five major disease categories that could have prompted high exposure to glucocorticoid drugs: pulmonary (chronic obstructive pulmonary disease or asthma), rheumatologic, oncologic, dermatologic, or gastrointestinal. If visit codes did not allow this identification and if the prescriber of the glucocorticoid drug was a subspecialist (e.g., rheumatologist), we identified the disease category as that category typically associated with the prescribing subspecialist. For patients with multiple diagnoses, we used the diagnostic category associated with a prescribing subspecialist; patients who had no prescribing subspecialist were assigned the diagnostic category with the largest number of visit diagnoses.

### Results

We found 22,444 members who met our criteria for high exposure to glucocorticoid drugs; of these members, 9,519 (42%) were men and 12,925 (58%) were women. Gender distribution of these members by 10-year age increments (see Figures 1, right, and 2, page 230) was similar for men and women, and two thirds of users were 50 years old or older (median age, 59 years).

Prevalence of high exposure to glucocorticoid drugs increased sixfold with increasing age (see Table 2, page 231): below age 50 years, less than 1% of health plan members had high exposure to glucocorticoid drugs, but more than 3% of members had high exposure by the age of 70. Most prescriptions were issued for pulmonary (28.4%) and rheumatologic (18.3%) diagnoses; fewer prescriptions were associated with oncologic (10.4%), dermatologic (6.9%), and gastrointestinal (6.1%) diagnoses.

Patients with high exposure to glucocorticoid drugs received prescriptions for these drugs from 3,788 health care providers. The number of these patients in any individual physician's practice ranged from 1 to 207 (see Table 3, page 231). Practitioners with the highest burden were rheumatologists (median, 68 patients per provider) and oncologists (median, 45 patients per provider). Nephrologists, pulmonologists, and gastroenterologists had an intermediate level of burden; the median number

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Potency Factor</th>
<th>Number (%) of Prescriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortisone</td>
<td>0.20</td>
<td>68 (&lt;0.1)</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>0.25</td>
<td>3,805 (2.2)</td>
</tr>
<tr>
<td>Prednisone</td>
<td>1.00</td>
<td>148,568 (87.7)</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>1.00</td>
<td>1,600 (0.9)</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>1.25</td>
<td>2,737 (1.6)</td>
</tr>
<tr>
<td>Triamcinolone</td>
<td>1.25</td>
<td>56 (&lt;0.1)</td>
</tr>
<tr>
<td>Dexamethasone</td>
<td>6.25</td>
<td>12,611 (7.4)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>169,445 (100.0)</strong></td>
</tr>
</tbody>
</table>

**Prescriptions for Adult Members with High Exposure to Glucocorticoid Drugs**

**Age Distribution of Male Health Plan Members with High Exposure to Glucocorticoid Drugs**
Who Bears Responsibility for Glucocorticoid-Exposed Patients in a Large Health Maintenance Organization?

of patients with high exposure to glucocorticoid drugs ranged from 11–18 per physician in these specialties. In contrast, internists had a median of three such patients per physician. However, internists were the largest specialty group of prescribers; three times as many patients with high exposure to glucocorticoid drugs received these drugs from internists as from rheumatologists, the next-highest prescribing group.

We repeated these analyses using two cutpoints of annual cumulative glucocorticoid exposure: more than 1 g prednisone equivalent and more than 3 g prednisone equivalent. Compared with the results obtained using the more-than-one-gram cutpoint, use of the more-than-three-gram cutpoint yielded 71% more patients with high exposure to glucocorticoid drugs, and use of the more-than-three-gram cutpoint yielded 37% fewer patients with high exposure to glucocorticoid drugs. Results of using each cutpoint did not change the distribution of patients seen by each type of prescriber. For example, for any given cutpoint, 40%–44% of patients with high exposure to glucocorticoid drugs received prescriptions from internists, and 11%–13% of patients received prescriptions from rheumatologists.

Discussion
By examining a computerized database of prescriptions issued to adult health plan members, we found that approximately 1 in 100 persons in any given year was exposed to potentially harmful levels of glucocorticoid drugs. Our study showed that high exposure to glucocorticoid drugs increases sixfold with increasing age and that rheumatic and pulmonary diseases were the most common indications for prescribing these drugs; these findings are similar to those of other surveys.

Our study is the first large-scale examination of prescribers of high-dosage glucocorticoid drugs. Considerable attention has been focused on the prescribing behavior of medical specialists such as rheumatologists and pulmonologists, in the belief that these specialists are the most frequent prescribers of glucocorticoid drugs. Although we did find that these medical specialists treat many patients who receive glucocorticoid drugs, we found that the larger group of generalists—not specialists—issue most prescriptions for glucocorticoid drugs.

This finding is important because it bears on the intervention systems that managed care organizations may choose to develop for reducing morbidity among patients exposed to high levels of glucocorticoid drugs. For example, now that effective drugs are available for prevention of glucocorticoid-induced osteoporosis, and with the impetus provided by new treatment guidelines, managed care organizations are likely to place a high priority on implementing interventions among these patients.

Similarly, a rheumatologist—who typically cares for 60–70 patients exposed to high levels of glucocorticoid drugs—is likely to give this condition quite different priority than would a generalist, who typically has only a few such patients. Whereas the generalist can manage treatment algorithms in the office, the rheumatologist has a large burden of care that is best shared with a case manager—perhaps a pharmacist or specially trained nurse practitioner.

A strength of our study is the novel algorithm we developed for calculating cumulative exposure to glucocorticoid drugs during consecutive 12-month periods; this algorithm enables a multitude of glucocorticoid formulations and dosages to be translated, first into standard prednisone equivalents, then into cumulative 12-month exposure, and ultimately into a "flag" that alerts the practitioner to patients whose cumulative use of glucocorticoid drugs is more than two grams. This algorithm can be easily adapted by managed care organizations equipped with access to a pharmacy database. (Data on specific programming issues and prescription identification are available from the authors.) By automating this system, a managed care organization can rapidly and accurately identify patients at risk and can relay this information to clinicians responsible for initiating prophylaxis against glucocorticoid-induced osteoporosis.

Currently, only 5%–14% of patients receiving glucocorticoid drugs in managed care settings receive bone-specific drugs for osteoporosis. In some cases, clinicians may fail to provide prophylaxis because they are unaware of the extent of their patients' exposure to glucocorticoid drugs; however, these health care providers may also be unfamiliar with newer, more...
Who Bears Responsibility for Glucocorticoid-Exposed Patients in a Large Health Maintenance Organization?

Our proposed system would address both deficiencies. Some limitations of our study are worthy of mention. Our method of flagging issuers and recipients of glucocorticoid prescriptions may not have identified the provider initially responsible for prescribing the glucocorticoid drugs. Whether the burden of preventing and managing glucocorticoid-related complications rests on the clinician who diagnoses and manages the case is arguable; another clinician may be prescribing these drugs in lieu of the responsible physician. More study is needed to identify and design systems that fairly and efficiently assign this responsibility and track a health care system's progress in increasing the proportion of patients who receive appropriate intervention against glucocorticoid-induced osteoporosis.

Another potential limitation of our study could be our choice of a 2 g prednisone cutoff. Perhaps a more liberal alert system would be based on a 1 g prednisone cutoff (equivalent to 100 days of 10 mg prednisone/day). Our choice of the 2 g cutoff satisfied several criteria: It is the dose which, taken throughout a five-year period, has been shown to cause adrenal suppression; it is equivalent to a year's exposure at 5.5 mg/day, a mean daily dosage associated with a statistically significant increase in both hip and spine fracture risk; and it is close to the dosage (more than 7.5 mg of prednisone per day for more than six months; equivalent to a cumulative total of more than 1.4 grams) that the American College of Rheumatology and the United Kingdom Task Force have suggested as the cutpoint indicating the need for active intervention.

In conclusion, we have developed a pharmacy database system that identifies patients exposed to potentially harmful amounts of glucocorticoid drugs. Using this system, we found that approximately 1 in 100 adult health plan members has this level of exposure and that the percentage of patients with high exposure rises with age. Nearly half these patients receive their glucocorticoid drug prescriptions from generalists who, on
average, care for only three such patients in their practice. Persons who are charged with developing managed care systems to improve the quality of care for such patients should consider identification and intervention systems built on pharmacy databases. Further, they should consider intervention strategies based on the number of highly exposed patients in each health care practitioner’s patient panel.

References


Prescription Pharmaceutical Market Goes Global for Consumers

It is no surprise that patients and payors are comparison-shopping for better prescription prices. It is also no surprise that they are looking to Mexico and Canada for lower prescription prices, since they go across the border to visit retail stores for lower prices on clothes, TVs, DVDs, food, and other consumer goods. Clearly, consumers benefit from the purchasing power of the U.S. dollar and from lower competitive prices. However, aside from the cost of drugs, there is something larger happening. The prescription drug market is going global for consumers.

Mexico and Canada are obvious places for consumers to comparison shop for prescription medications. But how much information is available to purchasers to make decisions about comparative costs in Canada or Mexico? A few years ago a client of mine requested a survey of the viability of sending employees to Canada or Mexico? A few years ago a client of mine requested a survey of the viability of sending employees to Canada or Mexico to purchase prescription drugs. With the permission of the client, I’d like to share the general lessons from this survey regarding available prices, information, and possible limitations for decreasing prescription prices.

A market basket of commonly used medications was used for comparison purposes, and drug wholesalers in Mexico and Canada were contacted for pricing. The conditions of the survey were that these pharmaceuticals must be in dosage strengths commonly used in the United States, that the drugs be made by ethical U.S. manufacturers or manufacturers that operated plants that had been inspected by the Food and Drug Administration (FDA), and that for comparison purposes the drugs were available in quantities of 100 units per bottle. The market basket consisted of omeprazole, atorvastatin, simvastatin, lasoprazole, celecoxib,amlodipine, fluoxetine, pravastatin, diltiazem, and loratadine.

The Environment in Mexico

Not surprisingly, drug manufacturers in Mexico, some of which are owned by U.S.-branded manufacturers, make drugs for consumption in Mexico only. In order for pharmaceuticals to be imported into the United States, the Mexican plants must be registered with the FDA and each product must be filed with the FDA under “A New Drug Application” (ANDA). (Our request for a list of registered plants in Mexico required several months for a response from the FDA.) Citizens of the United States may have prescriptions filled in “any willing” retail pharmacy in Mexico, although the pharmacies may not carry medications in the prescribed quantities. Based on the exchange rate at the time, the market basket sold at an 89% discount to its price in the United States.

The Environment in Canada

Branded pharmaceuticals sold in Canada must be approved by the Canadian equivalent of the FDA, known as the Health Products and Food Branch (HPB). Pharmaceutical manufacturers in Canada cannot be shipped into the United States, but products manufactured in the United States can be shipped into Canada. Certain HPB regulatory requirements, however, still prevail (e.g., all products must be labeled in English and French). Pharmacists in Canada cannot legally dispense prescriptions written by a U.S. physician, unless approved by a Canadian physician. There are however, many anecdotes of pharmacists and physicians who have sub rosa facilitated the prescribing and dispensing of medications in Canada for U.S. patients. Based on the exchange rates at the time the market basket sold at a 59% discount to its U.S. price.

The Global Environment

While Mexico and Canada are geographically close to the United States, the Internet provides a virtual world without borders. Drug distributors (e.g., GlobeXPharma.com and RxMarketplace.com) can supply pharmacies with medications. International drug manufacturers are increasingly visible in copying U.S. patents for branded pharmaceuticals. For example, Far-Mangininos, a state-owned manufacturer in Brazil, is selling acquired immunodeficiency syndrome (AIDS) drugs for half the price charged by U.S. manufacturers.

Patent laws differ in every country, and in spite of World Trade Organization international patent protections, countries are placing their internal health care interests ahead of the patent requirements. For example, Brazilian companies are allowed by their government to manufacture a branded medication if a U.S. manufacturer is not making it in Brazil three years after the patent is issued.

The overwhelming issue is that local interests are beating out commercial interests not just in drugs, but also in software, movies, music, and other commodities. Manufacturing and distribution is global so that international drug companies may subcontract-manufacture or they may manufacture their own products as well. The result is an expanding international market for patented and off-patent products.

Consumers can now embrace the international market, because they have price information and access to competitive prices over the Internet. The next step should be a free flow of marketing information about individual medications and comparative features and options of therapeutically similar medications. Information that manufacturers have traditionally offered only to providers (e.g., indications, frequency of dosing) should soon be available to consumers.

The global train has left the station. Between the free flow of information, consumerism, and globalism, the health care world will never be the same.

Reference

A re disease-management programs in correctional facilities effective from the perspectives of patient- care outcomes and financial justification? This is the question faculty within the Office of Managed Health Care Pharmacy Services (MHCPS) at the Texas Tech University Health Sciences Center School of Pharmacy (TTUHSC-SOP) are trying to answer.

In 1995, Texas Tech University Health Sciences Center (TTUHSC), through its Office of Managed Correctional Health Care (MCHC), contracted with TTUHSC-SOP to be the primary provider of pharmaceutical care to Texas Department of Criminal Justice (TDCJ) offenders in west Texas. Although TTUHSC had been providing health care to TDCJ offenders since 1989, it was not until the 1993 Texas legislative session that a managed health care network was authorized. This staff-model HMO has been previously described. In 1995, TTUHSC expanded its involvement in corrections by becoming the health services provider for youth offenders housed within Texas Youth Commission (TYC) facilities.

In 1995, the TTUHSC-SOP established the MHCPS as a pharmacy business unit to design and deliver services to the TDCJ and TYC populations. The primary mission of the MHCPS has been to provide a high-quality, cost-effective pharmacy benefit while integrating managed care practice into the academic programs of the school.

At issue was whether disease-management programs could control the escalating costs of providing drug therapy to correctional populations.

## The Service Plan

The leaders of the MHCPS chose early in the program to outsource drug distribution to a single provider for all offenders. This permitted MHCPS staff to focus on their prescription benefit management (PBM) activities while maintaining administrative oversight for the quality of drug distribution. Staff quality-assurance activities included monthly facility-quality meetings and quarterly pharmacy-inspection audits.

As it is at most managed care organizations, the early focus of MHCPS was population-based pharmaceutical care, such as formulary management, target drug programs, and drug-usage evaluation. These programs, although effective in managing outliers in drug utilization, were not as successful in dealing with the patient-care and financial issues arising from newer psychiatric treatments, chronic-care drug therapy, an aging population, and managing and treating patients with HIV and hepatitis C.

## Disease Management

In September 1998, the Texas State Board of Pharmacy and the Texas Board of Medical Examiners jointly put into effect rules permitting delegated drug-therapy management under a collaborative practice agreement. These rules provided the impetus for MHCPS leadership to propose a shift in strategy away from solely population-based pharmaceutical care to a model that also included patient-focused care and outcomes measurement. MHCPS and MHCH staffs began to meet regularly to plan how to implement pharmacist-initiated disease-management clinics for target medical conditions where data suggested possible drug cost savings. Once a pilot clinic plan was approved, the School of Pharmacy drafted standard collaborative practice agreements that conformed to Board rules; these were also reviewed by the health science center’s Institutional Compliance Officer.

The standardized protocol can be applied to all disease management performed by School of Pharmacy faculty regardless of practice site. It includes:

- a definition of the drug therapy authorized by the supervising physician,
- a description of the frequency of reporting to the supervising physician, and
- an overview of the drug therapy evaluation/diagnostic protocol and drug the plan/management, which we have chosen to organize using the SOAP (suitive, objective, assessment, plan) format.

Currently, MHCPS staff is engaged in asthma, chronic bronchitis and emphyema, diabetes, hypertension, anticoagulation, general psychiatric, and hyperlipidemia management programs. For each we collect longitudinal outcome data to evaluate patient-specific improvements and impacts on drug costs for facility and for specific formulary items.

For many of these chronic diseases, how do we have sufficient data to analyze trends for reporting to the Region Correctional Health Care Pharmacy Therapeutics Committee.

In summary, the MHCPS staff has developed a pharmaceutical care model that both population-based and patient-specific components. We continue to collect data to support this type of practice in correctional health and to support our continued involvement in this contract.

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## References

4. Patry RA, Habeger HA. Managed care pharmaceutical care at the Texas Tech Health Sciences C School of Pharmacy. JMCP 1999(Nov/Dec); 556-57.
Objectives: After completing this continuing education program, readers will be able to:
1. understand the general problems actuaries face in pricing health insurance,
2. explain how insurance is priced differently from other products,
3. describe the role of an actuary in pricing health insurance, and
4. discuss the contributions pharmacists can make to that work.

KEYWORDS: Actuaries, insurance, pricing, modeling, pharmacy trends

Rear Window: Actuaries and Pharmacists—Toward a New Competency

As almost everyone is aware, pharmacy costs in recent years have risen faster than any other component of health care costs, with rates in the mid-to-high teens. Given the estimates of utilization and new pharmaceutical product development, the trend is unlikely to slow in the near future. In fact, as the impacts of biotechnology and genomics research begin to unfold, pharmaceuticals are likely to make up more and more of the health care dollar. Accurately predicting the uptake and cost of new products could emerge as one of the most important issues health plans face.

Pharmacists and actuaries have an opportunity to work together to help estimate the effects of these new therapies. The goal of this article is to lay a foundation for pharmacists to understand the general issues actuaries face in pricing health insurance and to describe the increasing role pharmacists can have in that work.

What Is an Actuary?

Webster’s dictionary defines an actuary as a person who “computes premium rates, dividends, etc., according to probabilities based on statistical records.” I like this explanation of what the actuary does: “If an insurance company were a car, the president has her hands on the wheel, the chief marketing officer has his foot on the gas, the chief financial officer has his foot on the brake, and the actuary is looking out the back window giving directions.” But perhaps most appropriate is the Society of Actuaries’ creed, which is that the work of actuaries is to “substitute facts for appearances and demonstrations for impressions.” Actuaries put a price tag on future risks. They have been called financial architects and social mathematicians because their analytical and business skills help solve a variety of financial and social problems. Specifically, actuaries improve financial decision making by creating models to evaluate the current financial implications of uncertain future events.

Some examples: A life-insurance company sells a policy to a new customer. How much premium should the company charge to offset the risk of insuring that customer? An auto insurance company is thinking about giving a discount to customers with anti-lock brakes. How big should the discount be to reflect the different risks of cars that have anti-lock brakes and those that do not? The Environmental Protection Agency is considering a new regulation that will reduce harmful refinery emissions but will cost jobs. Is it worth the cost to reduce the risks to the health of people in the community? These are ques-
Rear Window: Actuaries and Pharmacists—Toward a New Competency

Actuaries must answer every day. They must therefore be educated in a variety of subjects. An experienced actuary is not only an expert in applied mathematics and statistics but also has a deep understanding of finance, economics, business law, and accounting.

If you have never met an actuary, that's not unusual. The actuarial profession numbers about 19,000 people in North America. But don't let that small number fool you. Actuaries put their special problem-solving skills to work in many different business situations, and their work has influenced people's lives for more than a century. Common areas of actuarial practice are pensions, life insurance and annuities, health, property and casualty insurance, and benefits consulting. While this article concentrates on health insurance, actuaries influence a wide range of businesses and decisions.

Pricing Health Insurance

Actuaries get involved in a variety of different areas within health plans, among them product development, legislative activities, medical management, claims payment practices, sales initiatives, and provider contracting. The reason is that all these areas can affect the underlying cost of insurance. The actuary's primary goal is to understand and incorporate the impacts of these things into the price of the product. Failure to do so properly can have serious consequences on the financial health of a company.

Insurance, rather than being a traditional type of product, is actually a promise in this case to pay for medical expenses incurred over a specified period. This means that the actual cost of the product cannot be known until the period is over because the number of claims is not known at the outset. In other businesses, the costs of a product are known before the product is ever sold.

This uncertainty is not terribly onerous as long as the total costs for a population during the period are easy to predict. Because probability and statistical theory lend themselves well to estimating the total costs for large numbers of people when the probabilities are stable, actuaries can calculate premiums based on probable overall costs.

Complicating this situation for health insurance, however, is the fact that both the number and frequency of medical claims are moving targets at all times. Charges for medical procedures change regularly, as do the types of services that are available and the frequency with which they are performed. In fact, treatments may emerge that were not even contemplated when the original prices were set.

Because health expenditures are so dynamic, prices for health insurance are constantly updated. They are typically set monthly and guaranteed for a 12-month period. Thus, if you are an employer group buying insurance in April, the price (the rate) for your group remains the same until April of the following year. If you were buying in May rather than April, your rate might be higher, but it would also be good for 12 months.

Predicting Claims

The methods that actuaries use to determine prices can get fairly complicated but they all boil down to one thing: The price is equal to the expected claims, adjusted for expenses.

\[
\text{Price} = \frac{\text{Expected claims}}{1 - \text{Expense load}}
\]

We will ignore the expense component. They are important in setting price, but all of the difficulty lies in expected claims. To calculate Expected claims, you need three things: Experience period claims, claims adjustments factors, and trend.

\[
\text{Expected Claims} = \left( \text{Experience Period Claims} \times \left( \frac{\text{Claims Cost Adjustments Factors}}{\text{Trend}} \right) \right)
\]

Experience Period Claims

This is the actuary looking out the rearview mirror: Experience period claims are historical claims for some defined population over a period of time. It is important that the experience represent or be able to form a solid basis, after adjustments for the costs of the population for which you are setting the rate. The experience could be for a single employer group or an entire block of business. If you are pricing for large employer groups with credible experience, you can use their own experience for setting rates.

More likely, though, you are setting rates for an entire block of business (i.e., a collection of groups or insureds with similar products or other characteristics, such as group size, underwriting method, or geography). While specific groups within the block may have purchased coverage at different times and be paying different premiums, many of the factors used to calculate the rates are the same for the entire block of business. For pharmacy, a block of business could be Medicare+Choice, for example. It would be difficult to use the experience from a commercial block of business to model pharmacy claims for Medicare, since the underlying populations and cost drivers are so different.

Claims Cost Adjustment

Once the experience period is selected, the adjustment factors are used to adjust the historical claims up or down for any changes that will affect your costs. They are adjustments for changes that have already occurred, or that you know will occur but are not entirely reflected in the experience period. Their purpose is to restate the historical claims as though the impact of any changes were in place during the entire experience period just as they will be during the rating period.

Some of the things for which adjustments to historical expe-
Experience might need to be made may be tied to the demographics of specific groups, while others apply to the broader population. When they are group or insurance-specific, the rates for the group or person may be adjusted based on their demographics. If they cannot be applied differentially during rating, it is important not only that the factors be accurate but that you estimate correctly the mix of these individuals or groups within the entire block of business. For example, if you have factors that reflect differences in cost by age but do not (or cannot, perhaps by law) set different rates for people based on age, you would need to estimate the average age mix you will have. Even if your factors are correct, if you miscalculate the mix, the final rates would be wrong.

Regardless of the type of adjustment, the goal is to estimate how changes in the following areas will affect claims costs. For each area, there is often an impact to both cost and utilization for different types of health care expenses. Actuaries need to estimate both.

• **Covered Services:** What if, for example, the definition of covered services changed so that you began to cover OTCs (over-the-counter medicines)? What if a new drug like Viagra was coming onto the market and your contract did not have specific language dealing with this type of medication? If you cover it, how will it affect costs?

• **Benefit Levels and Cost Sharing:** These are the copay, deductible, and other cost-sharing provisions. Benefit levels affect not only the net cost of a service but also utilization, as is clear from changes in drug copays. Small increases in copays can reduce costs by more than the change in the copay amount would indicate. Changes in office visit copays can also affect drug costs: If office visit copays go down, prescription utilization will increase.

• **Geographic Area:** Many costs differ by area, often due to differences in physician practice patterns. If your historical experience has the majority of business in one area but your sales organization has decided to target another area, what sort of adjustments should you make?

• **Age/Gender/Family Mix:** Costs can differ dramatically by age and gender. What if you discovered that recently you have had a higher proportion of younger people than you have had historically? If one of the rating factors you apply to individuals is based on age, would you make any adjustments? Are there any “side effects” of this shift for which you do not have individual rating factors that could affect your future experience?

• **Group Size and Underwriting Method:** Within commercial business, smaller groups may have been underwritten and therefore represent a different risk (or estimated cost) than groups that have not. Underwriting (the process of risk selection and classification) can wear off: Groups that were initially classified as representing a certain level of risk can have their classification change as they regress toward the mean. In addition, any change in your underwriting methods can change the risk you attract or retain. Assuming you currently underwrite your business, what would you predict to happen to costs if the sales force tells you it will bring in twice as many groups next year as this year? Would your answer change if they told you that, in order to do so, you needed to change how you underwrite your groups?

• **Medical Management Programs:** There are a large number of programs designed to control the medical costs of insureds. They include case, disease, and pharmacy management programs that are targeting specific diseases, situations, or conditions. What would happen to costs if you implemented an asthma program within your block of business? How would you reflect this in your rates?

• **Provider Contracts:** Changes to contracts with hospitals, physicians, labs, pharmacies, etc. take place throughout the experience period and you need to adjust your experience to reflect the most recent deals. These adjustments must also reflect adding or removing providers. Such changes can influence your sales to or retention of certain types of risks, or change the geographic distribution of business. How would you adjust your experience to estimate what would happen if you lost the flagship hospital out of your network?

• **Legislative Changes:** Changes in the regulatory environment could be classified under another category (such as mandating coverage of certain drugs), but others are broader. What happens, for example, when the government institutes a program for Medicare that includes pharmacy coverage? If you are offering pharmacy coverage to your Medicare + Choice population, will you retain these members? If so, will they have the same cost levels as your members have had in the past? Perhaps your coverage is richer than the alternative choices and those who stay are only those who need the higher coverage. In that scenario, your average claims costs per retained-member would be higher than they had been.

There are other areas where you might need to make adjustments, but this gives you some idea of the scope and variety of things that can impact costs, and thus insurance pricing.

### Trend—The Last Frontier

Most of the adjustments you have just made to your experience, while very important, did not move the claims through time. Most of them adjusted the historical claims up or down based on new business dynamics; they did not take into account that, all other things being equal, the cost and utilization of health care tends to go up over time.

Trend is the last adjustment, the magic factor that moves those adjusted historical claims through time to the period for which rates are being set. It is meant to take into account your best predictions for what is going to happen in the future after you make all the previous adjustments. This is where time is not on your side; there is a large gap between when you are doing the work...
needed to calculate the rates and when they will be used.

Through the Looking Glass

Imagine it is September 1, 2000, and you need to set rates for January 1, 2001. You cannot wait any longer; legislative requirements and your internal systems for calculating premiums require that rates be available within two weeks. The usual experience period used is often one year, which is large enough to be credible and avoids seasonality issues, so you decide to use July 1, 1999 through June 30, 2000, with a midpoint for the period of January 1, 2000.

Why the two-month gap between the end of the experience period and now? This is called the completion period. It takes time for all the claims to be submitted to the payer for reimbursement and processed as a claim. For pharmacy claims, most of which are adjudicated on-line, claims are paid very quickly. The information on claims data can be made available almost immediately. For medical claims, which are not adjudicated online, the process can take anywhere from 6 to 12 months.

Actuaries have ways to estimate the final claim liabilities for months where only a portion of all claims have been submitted. Collectively, amounts for "incurred but not reported" (IBNR) claims are called reserves. Actuaries use various methods to calculate reserves. A typical method uses historical data to calculate how long it takes for a month of claims to be completely paid. When these calculations indicate that 65%–75% or more of claims are likely to have been paid, actuaries will start using these "completion" estimates to increase the known, paid amounts in each month by the percent estimated to remain, thus calculating the final liability. For months with less than this percentage, usually the most recent two to three months, there is insufficient information to make credible completion estimates, so reserves are set using different methodologies. That is why the two most recent months are typically avoided for experience studies.

The rate you are setting is for January 1, 2001, but the estimate you make must be for all medical expenses for the 12-month period from January 1, 2001 through December 31, 2001, with a midpoint of July 1, 2001). In order to move your adjusted claims forward from its midpoint of January 1, 2000 to the midpoint of the rating period, the trend adjustment must be for 18 months. Because the time lags are long, estimating trend is critical. If you are off even by a little, the difference is compounded because the period over which trend must be estimated is so long.

Measuring Trend

Trend should represent the change in the underlying dynamics of cost and utilization for health care, not changes in cost per se. Looking at your financial statements or reports, you may see a trend of, say, 8% for pharmacy. This represents the change in costs, period over period, but not the underlying secular trend.

The 8% change could be the result of some change in the past that may not be repeated (such as increasing copays or introducing three-tier benefits). To measure secular trend, you need to remove or normalize everything so you can see the underlying patterns absent any of those changes.

Here again we have actuaries looking out the rearview mirror. Trend is supposed to be an estimate of the direction and degree to which our future will differ from our past, yet the only data we have is our historical data. When looking at historical experience, you need to look at different types of trends (12 month, 3 month, 1 month) and use external estimates in addition to those based on company experience. It is important to know not only the degree of trend but where it is headed. Is it going up? Going down? Will it change direction? Are there new technologies on the horizon that are not yet taken into account? Are formularies being outlawed or severely restricted? When? What will the impact be?

Missing Trend

Estimating trend incorrectly can be painful. Suppose we think secular trend will be 7% between our experience period and the time for which we are setting our rates. Compounding 7% over 18 months gives us the amount by which we would increase our adjusted historical claims:

\[(1.070)^{18/12} = 1.107\] If trend were really 9%, the factor should have been \((1.090)^{18/12} = 1.138\), and our estimates—and rates—would be too low by almost 3% (the ratio of 1.138 and 1.107).

Pharmacy trends can be difficult to estimate. Characteristics like patient demand, consumer advertising, physician detailing, and technological development combine to make the dynamics of pharmacy costs different from other types of health care; pharmacy trends may be more volatile. If, for example, pharmacy costs are 15% of total costs, missing pharmacy trends by 5% (perhaps due to the unanticipated demand associated with a new breakthrough drug) can mean missing overall trend by 0.75%.

The situation is magnified by the fact that, whatever the reason for your initial trend estimate, it will take time for you to find out that your estimate was wrong. If you continue to use the same numbers until you see new information emerge in your experience and trend calculations, it can have a dramatic financial impact—enough that, if continued over time or if large enough, it can create serious financial consequences for a health plan.

All the King's Horses

This is where pharmacists and actuaries need to work together. While vice president of pharmacy management for a large health plan, I became aware that a partnership of actuaries and pharmacists (and clinicians in general) can create a compelling value. Together, we created new knowledge and methods that
proved vital to managing and estimating drug costs, techniques that neither of us could have created without the other. In any health plan, I would recommend that pharmacists:

- Partner with actuaries to help estimate trends for pharmacy costs, recognizing that of the three elements discussed (experience periods, adjustment factors, and trend), estimating trend is the hardest.
- Keep actuaries informed about new drug launches. The time lags associated with setting rates make the situation even more critical, especially with the pace of new drug development.
- Jointly create models for emerging therapies and work together to estimate their impact. In doing so, work with them to:
  - Understand the models and the populations being used in the experience.
  - Document assumptions and sensitivity-test models so you know which assumptions are the most important.
  - Track these assumptions against emerging experience so you can make any necessary adjustments quickly.
  - Involve the actuaries in the design of medical and pharmacy management programs, so they know what business will be affected, when, and by how much.

The need for this type of partnership will continue to grow. Pharmacy trends show no signs of slowing; pharmaceuticals continue to make up more and more of the health care dollar. Given all the new drug research and likely resultant products, accurately predicting their timing, uptake, and cost will become critical to