The Value of Pharmaceuticals and Managed Pharmaceutical Care
Introduction

In an era of continually rising expenditures for health care, what role do pharmaceuticals play? Why are expenditures for prescription drugs increasing in comparison to other health care outlays? Are we getting a fair return on our investment in pharmaceuticals? What is the managed care pharmacy profession doing to maximize the return on that investment?

Questions such as these do not lend themselves to simple answers. The role of pharmaceuticals within today’s health care system is complex, as is the role of managed care pharmacy in promoting their optimal use and effectiveness. The overriding question is whether pharmaceuticals, properly prescribed and managed, add value to health care, that is, whether they deliver a fair return on our investment in them. Is there a positive relationship between costs and outcomes?

The value of some pharmaceuticals can be readily appreciated, especially with the benefit of hindsight. A classic case in point: polio vaccine. Older Americans can remember the terror of poliomyelitis, an infectious viral disease of the central nervous system that often paralyzed children (and was thus called infantile paralysis) but also struck down adults, including, for example, the young Franklin Delano Roosevelt. Many polio victims, unable to breathe on their own, spent their lives in so-called iron lungs. FDR, who lost the use of his legs, spent four terms as President of the United States in a wheelchair.

Then, in the 1950s, researchers Jonas Salk and Albert Sabin developed the first vaccines that proved effective against polio. Figure 1 shows what happened after mass immunizations began nationwide. A disease that afflicted 57,879 Americans in 1952 has all but vanished as a public health threat.

While most pharmaceutical advances may not be this dramatic, there have been many instances over the years in which newly developed drugs have not simply reduced mortality, but have also allowed patients to live much healthier and more productive lives or to return from illness to a higher state of health than would otherwise have been possible.

In short, pharmaceutical spending may be offset by many kinds of direct and indirect benefits, including less time spent hospitalized, convalescing, or otherwise away from work. These improvements in productivity would otherwise have been lost on an ongoing basis to chronic physical or mental illnesses. It is in this context that the pharmaceutical cost/value relationship, along with the role of managed care pharmacy in maximizing value, needs to be considered.

Assessing the impact of recent trends

Although pharmaceutical spending accounts for less than 10 percent of the nation’s $1.1 trillion annual outlay for health care, a recent Mercer/Foster Higgins survey of employer-sponsored health plans shows how dramatically such spending has risen relative to other health care expenditures. On the medical side, spending increases for 1998, 1999, and 2000 were 6.1 percent, 9 percent, and 12 percent respectively. On the pharmaceutical side, spend increases for the same period were 15.5 percent, 16.4 percent, and over 20 percent.

Figure 2 shows 30-year spending trends for hospitals, physicians, and pharmaceuticals, and Figure 3 shows pharmaceutical vs. medical spending increases for 1998–2000.
The discrepancy between medical and pharmaceutical spend increases has led many observers to question whether managed care is doing its job in keeping quality care affordable. A careful look at the facts is warranted.

Data compiled by IMS Health, reflecting actual dollars spent on prescription drugs by pharmacy benefit management companies (PBMs) and health plans, point to three major factors (see Figure 4). The data indicate that 4.6 percent of the increased spending was attributable to price inflation. The prescribing habits of physicians, that is, a shift to prescribing newer medications, accounted for 6.3 percent of the increase. The third factor, and the largest, is increased utilization, which accounted for 10.8 percent of the increase. In other words, there was a substantial increase in the number of Americans taking prescriptions and in the number of prescriptions being taken.

As the data indicate, the shift to newer medications and increased utilization are clearly factors that merit a closer look.

The shift to newer medications. Newer medications can be more expensive, especially if they are used instead of a low-cost generic product. There are many cases, however, where the shift from older to newer medications can be justified on clinical grounds. Managed care pharmacy has an important role to play in evaluating new medications to determine the added value they may bring to the management of disease or symptoms.

Newer drugs may be more effective, may have fewer side effects, or may lend themselves to being taken more readily, thus improving the prospects for patient compliance. For example:

- Increased effectiveness: Only a few years ago there were few medications that were more than marginally effective against migraine headaches. Now a new class of triptan drugs, serotonin receptor boosters, is sharply reducing suffering and increasing productivity.
- Fewer side effects: Tricyclics, a relatively early class of antidepressants, were often effective, but frequently caused weight gain and drowsiness. Newer antidepressants do not have these side effects.
- Dosage improvements: In the 1970s, patients suffering from peptic ulcers had to try to ward off surgery using little else than liquid antacids. Tagamet® revolutionized the treatment of ulcers by enabling patients to take a tablet four times a day (at meals and at bedtime). Then came twice-a-day and then once-a-day dosing. Result: greatly improved patient compliance and a dramatic drop (over 72 percent) in ulcer deaths.

Newer drugs also make it possible to treat previously untreatable diseases. Although there is still no cure for all cancer, many forms of it can be treated with pharmaceuticals, often with dramatic results. Cancer deaths among children, for example, have dropped by nearly 60 percent in the past 25 years. Childhood leukemia, once nearly always fatal, is now survived by eight out of ten patients.

Similarly, AIDS was untreatable when first identified in 1983. Today, combination drug therapy has reduced AIDS mortality in the United States by more than 70 percent. Thousands of Americans with HIV/AIDS have been able to remain at work and out of the hospital, thus in many cases offsetting the relatively high cost (in the range of $15,000 annually) of combination drug therapy.

Increased utilization. The number of prescriptions dispensed annually in the United States rose from 2 billion in 1992 to 3 billion in 1999 and, as shown in Figure 5, is projected to reach 4 billion by 2004.
There are four main reasons why utilization is on the rise:

- Managed care makes prescriptions affordable for millions of Americans who might not otherwise be able to pay for pharmaceuticals. Health plans offer broad pharmaceutical coverage with generally low out-of-pocket costs. With enrollment in health maintenance organizations (HMOs) and preferred provider organizations (PPOs) increasing from about 75 million in 1991 to more than 175 million in 1999, access to prescription drugs has broadly increased.

- More attention to prevention and improved diagnosis can mean greater drug utilization. One of managed care’s hallmarks is its emphasis on diagnostic and screening programs, which greatly improve the odds of identifying and treating conditions that might otherwise go undiagnosed until an illness reaches the acute stage. Asthma and diabetes are good examples. Drug therapies are often prescribed. Greater utilization also result in part from the fact that, thanks to the information explosion and the efforts of managed care organizations, patients are better informed about the effectiveness of treatment than ever before.

- An increasing commitment to evidence-based medicine has led to the development of treatment protocols that often rely on pharmaceuticals to improve outcomes. In the case of hypertension, for example, it was common practice fifteen years ago not to treat borderline-hypertensives. Several multi-year studies in the United States and abroad showed that treating borderline patients with certain medications would significantly reduce the long-term risks of heart attacks and strokes. The resulting best-practice protocols from these studies, coupled with attention to the studies in the media, and resulting increase in patient awareness of treatment options have led to increased use of pharmaceuticals. The increased use of these medications have reduced both the clinical and societal costs associated with these life-threatening conditions. In addition new medications that treat previously untreatable diseases also lead to higher utilization, but clearly with positive results.

- The aging of America generally translates into increased reliance on pharmaceuticals to maintain or restore health and to do so over longer periods of time. Congestive heart failure (CHF), for example, affects an estimated 2 percent of Americans age 40 to 59, more than 5 percent of those 60 to 69, and 10 percent of those 70 or older. As the baby boom generation approaches retirement age, the population of the elderly will increase by an estimated 33 percent between 2000 and 2020. Increased reliance on pharmaceuticals to prevent and treat CHF and other conditions affecting the elderly, multiplied by the predictable increase in the number of persons with such conditions, will clearly have a significant and continuing impact on overall utilization.

The direct value of pharmaceuticals

As previously noted, pharmaceuticals have both direct and indirect value. Their direct value is typically seen in their ability to improve mortality, quality of life, and symptom relief or tolerability, and to prevent or mitigate complications and expenditures for more expensive services.

- Improved mortality: Pharmaceuticals have eliminated or brought under control many diseases and conditions that once had high mortality rates (e.g., diphtheria, influenza, pneumonia, polio) and have dramatically reduced mortality rates for many others (e.g., AIDS, asthma, heart attacks, stroke, ulcers). Figure 6 shows the percentage reduction in age-adjusted death rates from 1965 to 1996 for asthma, heart disease, ulcer disease, and infectious diseases.
• Improved quality of life: Pharmaceuticals can help patients improve their quality of life in various ways. In the case of asthma, for example, daily use of certain medications typically improves well being and reduces hospitalizations. The debilitating effects of depression, estimated to affect about 10 percent of adult Americans and considered the single most debilitating illness in terms of impaired functioning at work, can often be relieved by pharmaceuticals. Women at risk for osteoporosis can use pharmaceuticals to help them remain active and independent. And, as previously noted, pharmaceuticals are helping thousands of HIV/AIDS patients to avoid hospitalization and disability.

• Symptom relief: Non-steroidal anti-inflammatory drugs (NSAIDS) can alleviate many kinds of pain and discomfort, and some of the newer NSAIDS can do so with lower risk of undesirable side effects. Similarly, non-sedating antihistamines can alleviate the sneezing, general discomfort, and even shortness of breath triggered by allergies, without bringing on the drowsiness associated with earlier antihistamines.

• Prevention of disease or mitigation of the complications of disease: Pharmaceutical treatments to guard against the onset of osteoporosis have the advantage of greatly reducing the risk of hip fractures and the attendant costs of hospitalization, rehabilitation, and reduced functioning. Drugs to control hypertension can reduce the risk of stroke, and clot-busting drugs can reduce the impact of stroke when it does occur. Cholesterol-lowering drugs can prevent heart attacks and their consequences. Drugs to treat ulcers greatly reduce the need for surgery and thus avoid the risk of surgical and post-surgical complications. Drugs to manage diabetes can sharply reduce the risk of diabetic complications such as kidney dysfunction and loss of vision.

The examples above offer just a representative sample of the many ways in which pharmaceuticals provide direct value. Another is in reducing reliance on emergency rooms, generally the most expensive venue in which to receive care and in some ways the least efficient and effective, since emergency departments are not geared to meet the patient’s total needs nor to support continuity of care.

Asthma sufferers, for example, are likely to go to the emergency room when they experience an acute attack. Aggressive treatment in the ER can open airways and temporarily resolve a life-threatening situation. But when asthma is inadequately monitored and managed, patients are likely to experience a succession of these acute attacks.

The solution for most asthma patients, according to the guidelines of the National Asthma Education Program, is to use inhaled corticosteroids daily to combat inflammation. In a New England study their use has been credited with a 50-percent decrease in hospitalization, and a demonstration program in Virginia found that proper management and use of asthma medications reduced both ER and urgent-care visits by 42 percent. In the Virginia case, as Figure 7 shows, for every $3 spent on asthma medicines, $17 was saved in emergency-room costs.

Pharmaceuticals can also reduce reliance on more expensive medical interventions. There are numerous examples of this, but a dramatic one involves the development of the H-2 antagonists and Proton Pump Inhibitors (PPIs) to treat gastric ulcers. The availability of these products has reduced the need for surgery ten fold.

**The indirect value of pharmaceuticals**

In addition to their direct value, pharmaceuticals have important indirect value in helping people live normal, productive lives rather than being forced to succumb to the debilitating effects of illness, particularly chronic conditions. For employers, the indirect value of pharmaceuticals is reflected in reduced absenteeism, increased productivity, and overall improvements in workforce health.

Many employers are working with their managed care pharmacy partners to view pharmaceuticals as an investment and, as with any investment, are paying close attention to the cost/benefit ratio. For example, a California study found that among patients with severe asthma, 71 percent had missed work because of the disease in the previous three months. In this case the benefits to employers of proactive asthma management are clear.

Health care researchers are assisting employers with this kind of analysis. For example, in 1997 researchers at the Massachusetts Institute of Technology (MIT) joined with others to measure the productivity of employees who suffer from various health conditions when treated with prescription medication.
In one study the MIT researchers examined employees who suffered from depression, anxiety, migraines, or hypertension. They reviewed pre- and post-treatment work records for these employees to determine the number of hours worked in a two-week time period. Figure 8 shows the results. Employees receiving treatment with pharmaceuticals, particularly those being treated for depression, were able to significantly increase the number of hours worked.\textsuperscript{41}

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\caption{Pharmaceuticals Improve Productivity}
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As these examples illustrate, the indirect value of pharmaceuticals is an important component of their total value. With this in mind, researchers have suggested that employers concerned about the rising costs of health care coverage should make a balanced assessment of such costs by conducting a careful analysis of physical and mental conditions impacting employees, identifying the leading cost-utilization drivers, and exploring the role of various therapies and regimens in mitigating and managing such conditions.\textsuperscript{42} In many cases the combined direct and indirect value of pharmaceuticals when properly prescribed and managed will be found to far outweigh their costs.

\section*{Maximizing the value of pharmaceuticals: the role of managed care pharmacy}

The pharmaceutical industry at any given moment has more than 500 new drugs in the pipeline of research and development, with most targeted at major diseases estimated to cost more than $640 billion annually in direct medical expenses and lost productivity.\textsuperscript{43} Some of these drugs will obviously be more efficacious and cost-effective than others. Assessing the relative merits of various drugs for various patients in various settings is clearly an enormous challenge.

With more than 175 million Americans currently receiving their health care through managed care arrangements, the role of managed care pharmacy in maximizing the value of pharmaceuticals is significant. That role, however, is not always well understood.

The goal is simple: to provide the right drug, to the right patient, at the right time. The challenges involved in meeting that goal, however, are numerous and complex.

\section*{Pharmaceutical selection.}

The first challenge is to provide the right drug from among the panoply of available products. Managed care develops formularies, which are lists of preferred medications, as judged by a panel of experts, used as prescribing guides to help select the most appropriate medication within a specific class of drugs.

The process of making formulary determinations begins with a pharmacy and therapeutics (P&T) committee consisting mainly of physicians and pharmacists whose mission is to review medications and determine their effectiveness, safety, and overall value, both on their own merits and relative to alternatives.
The P&T committee usually examines medications by therapeutic category and first examines overall safety and efficacy. Once the most favorable medications have been identified, the committee examines cost factors to determine the best value. When this process has been completed, the committee determines the level of coverage that a medication will have. If a lower cost generic medication has been shown to produce an equivalent or superior clinical response, P&T committees promote them as the best value for that pharmaceutical class. P&T committees must constantly evaluate newer medications to determine which ones truly deliver excellent value as well.

The medication selection process is made more complicated because of individual responses to drug therapy. Even when the most ideal medications have been selected for preferred coverage, there will be times when an individual patient will need to receive a different agent. The process for making individual exceptions where appropriate is an important aspect of this formulary management process and it underscores the goal of meeting individual patient needs.

Drug utilization review. Further complicating drug selection is that there are other factors to consider when a specific medication is prescribed for a patient. A formulary may include some of the best medications, but clinicians need to determine if a drug is appropriate for a particular patient at the time the patient is receiving it. For example, there may be other medications that a patient is taking that will conflict with the new therapy.

To deal with such issues, managed care has developed a vitally important process called drug utilization review (DUR). Prior to a medication being dispensed, it is reviewed against all other medications that the patient is known to be taking. Possibly a different prescriber has ordered a medication that might cause an adverse interaction or might duplicate the actions of another drug. When these types of situations arise, the managed care system warns the pharmacist that a potential problem exists. The pharmacist must then communicate with the patient and/or physician to determine the appropriateness of the new medication being dispensed.

The DUR system can also be used to ensure that new prescriptions comply with plan benefit parameters. Medications are commonly covered for a specific time period (for retail prescriptions the norm is 30 days). The DUR system will review all new prescriptions to determine that the day's supply is within coverage limits. DUR can be helpful in assessing patient compliance and in detecting people who may be attempting to defraud a prescription drug program.

DUR's principal function is to help ensure that the right drug gets to the right patient at the right time. In doing so, however, DUR also helps maximize the value of pharmaceuticals and pharmaceutical expenditures. A 1994 study by Minnesota researchers determined that every dollar spent on the DUR process saved $2 to $3 in pharmaceutical costs. These savings were realized mainly by preventing drug-to-drug interactions, controlling for under- and over-utilization of medications, and improving compliance with benefit parameters.

Providing information to all members of the health care team. Physicians and other members of the health care team are constantly challenged to find the time to locate, assess, and absorb information regarding the latest and most effective drug therapies. One of managed care pharmacy's responsibilities is to disseminate such information by mail, fax and, increasingly, online. Access to this kind of information is important for health care professionals, plan sponsors, and patients.

Managed care organizations work with physicians and other health care team members to meet national guidelines for drug treatment of specific disease states, such as diabetes, asthma and hypertension. In this way managed care pharmacy makes an important contribution to the adoption of best practices and the advancement of evidence-based medical care.

For example, considerable research in recent years has shown that patients who have had a myocardial infarction (MI) are much more likely to recover and to have fewer relapses when their hypertension is treated with a class of drugs called beta-blockers. Studies have shown, however, that beta-blockers have been underutilized. Many managed care organizations are identifying patients who may benefit from these medications and then working with their physicians to ensure that patients will receive the benefits from this class of drugs.

The National Committee for Quality Assurance (NCQA), studying data from NCQA-accredited health plans, found that physician use of beta-blockers to treat MI patients increased from 62.5 percent of cases in 1997 to 82.3 percent in 1998, nearly a one-third increase in a single year. In terms of mitigating the effects of MI, this has clearly been a cost-effective initiative. Even more importantly, it has saved lives: NCQA estimates that increased use of beta-blockers meant the difference between life and death for 2,000 patients in 1998.

To put the value of beta-blockers and, by extension, other drug therapies into a broader context, we can use economic analysis to compare the cost of saving the life of a heart attack survivor with other life-saving interventions. Figure 9 shows some comparisons. For example, the nation must invest about $210,000 in smoke detectors to save a single life. We must spend $110,000 on mammography to detect and treat a single life-threatening cancer. These are rightly considered good investments. By comparison, beta-blockers cost $850 per patient on average. The extraordinary value they deliver is measured not only in saving lives, but also in preventing severe complications and improving the prospects for a healthier life.
Medication distribution networks. Managed care organizations establish and oversee regional and national networks of pharmacies qualified to meet members’ needs, including mail-order and internet-based pharmacy services. Programs are also in development to promote quality improvement and to minimize prescribing and dispensing errors by creating new networks that use the latest in hand-held computer technology.

Once again, the goal is to get the right drug to the right patient at the right time. The Institute of Medicine (IOM) in its recent much-publicized report on medical errors identified mistakes in prescribing and dispensing drugs (often in hospitals) as the single largest cause of medical errors responsible for an estimated 44,000 to 98,000 preventable deaths annually. Managed care organizations are in the forefront of efforts to reduce the prevalence of such errors by designing and implementing systems to anticipate and control them.

Demonstrating the value of managed care pharmacy

Numerous studies support the conclusion that active care management maximizes the value of pharmaceutical benefits. To improve treatment of congestive heart failure (CHF), for example, a major health plan enrolled 2,100 patients in a CHF disease management program emphasizing education about the disease, the importance of adhering to a treatment regimen including taking prescribed medications such as angiotensin-converting enzyme (ACE) inhibitors, and dietary changes.

The program produced impressive results. A study found that although pharmacy costs increased by $243,000 (60 percent) primarily because of increased use of ACE inhibitors, the program saved $9 million in hospitalization costs avoided. On a per-patient basis, the increased cost for drugs amounted to $1,674, while the hospital costs avoided totaled $10,617. This cost offset resulted in a net savings of $8,943 per patient. Given that CHF affects millions of Americans and accounts for nearly 900,000 hospitalizations annually, the benefits of active pharmacy management, in tandem with programs to manage diet and other lifestyle changes, are abundantly clear.

The databases used by managed care organizations have many benefits above and beyond controlling medical errors and inappropriate utilization of pharmaceuticals. Data can also be used to evaluate the treatment of patients with specific diseases. A good example is the Diabetes Netcare Management Program, operated by seven different managed care organizations.

In 1998 there were 7,000 diabetic patients enrolled in the initiative, which included a patient-education program, a program to promote compliance with prescribed therapy regimens, and a program to keep physicians informed of evolving national best-practice guidelines. A key element contributing to the success of the initiative was the use of advanced information technology to link all aspects of the program.

A progress review, conducted after the first year of the program, found that hospital admissions had dropped by 18 percent and that the program had achieved a savings of 12.3 percent in overall expenditures on diabetes management. This is a clear-cut example of how the best care can also be the most cost-effective. With managed care organizations coordinating care with all members of the health care team, everyone wins: patients enjoy better health and health care purchasers can see the value of their health care outlays.

Another such program, for patients with asthma, was put into effect by one of the largest pharmacy benefit managers in the United States. AdvancePCS designed a program with the goal of improving patients’ health and reducing overall costs. A total of 1,811 patients with chronic asthma were enrolled in the program and followed for 12 months. The program involved educating them about asthma and explaining the purpose and proper use of each medication; performing follow-
ups on a scheduled basis; performing treatment reviews; and educating physicians about national best-practice guidelines and informing them of their patients’ compliance with prescribed regimens.

A program assessment at the 12-month mark showed significant progress. Although medication costs increased, emergency room visits declined by 17 percent; hospital admissions declined by 14 percent; the number of hospitalized days declined by 21 percent; and doctor visits declined by 22 percent. In one year the program saved $270,000, or $150 per enrollee.

Another example in the treatment of asthma involved a health plan in Utah. Intermountain Health Care reviewed the medication usage patterns of its asthmatic patients. By working with their participating physicians, the plan was able to increase the use of inhaled corticosteroids, which help control the disease, and reduce the need for beta-agonists, which treat the symptoms such as wheezing. While improving the care of these patients the plan was able to reduce emergency room visits by 54% and hospitalizations by 34%.

These are excellent examples of managed care initiatives that improve health while constraining overall costs. Consider the implications for a moment. It is estimated that 17 million Americans have asthma and they make more than 1.9 million emergency room visits per year. The direct costs of asthma are estimated at more than $9.8 billion annually. Proper use of pharmaceuticals, through well-conceived disease state management programs can improve the health of millions of Americans, while at the same time producing a dramatic overall savings.

**Conclusion: Maximizing the return on our investment**

Whether you are an employer, a patient, a physician, a pharmacist, a health plan administrator or a policymaker, the challenge in the years ahead is essentially the same. Given the combination of factors driving health care spending — including new science, broader coverage, better practice, the aging of the population, and the staggering array of illnesses for which people are at risk — it is a given that health care expenditures will continue to increase. The challenge is to be ever more resourceful about how we invest our health care dollars, in order to maximize the return on our investment.

As this overview suggests, it is shortsighted to look at pharmaceuticals only in terms of their costs. The task is to make a balanced assessment of costs and benefits, taking into account both direct and indirect benefits. In case after case, the evidence suggests that pharmaceuticals, when properly chosen and managed, yield benefits that more than justify their costs. In short, they add value.

It is equally shortsighted to assess the value of managed care only in terms of its ability to reduce costs. Managed care’s mission is to maximize value by making sure patients get the right care at the right time and in the right setting. In the case of managed care pharmacy, the task is first to put the right drug into the hands of the right patient at the right time and then to see that drugs are used as directed, progress is monitored, care guidelines are observed, and optimal outcomes are achieved.

This is no small task, but the examples sighted throughout this report show that the hard work is being done. Above all, it is the work of partnership. Health plans, patients, physicians, pharmacists, employers; each has a crucial role to play in maximizing the effectiveness of pharmaceuticals. The key to future successes, then, is to build stronger partnerships among the stakeholders, based on better understanding the true costs and benefits of pharmaceuticals and our role in maximizing their value.

Employers, as the major providers of health coverage for working-age Americans, may have the most to gain from strengthening these partnerships. There is much that employers can do to maximize the value of pharmaceuticals. For example:

- Develop meaningful data on the leading illnesses affecting the workforce.
- Work with health plans and pharmacy benefit managers to identify exemplary programs to improve identification, treatment, and monitoring.
- Encourage employees to participate in disease-management initiatives.
- Avoid blanket policies limiting or denying coverage for pharmaceuticals solely on the basis of price.
- Conduct a one-year review of progress to measure the costs and benefits of drug therapies in terms of increased productivity, lower hospitalization rates, fewer lost workdays, etc.

Assessing the efficacy of pharmaceutical therapies on a workforce-by-workforce basis is not simple. Health plans, pharmacy benefit managers, and pharmacists can greatly assist employers, especially smaller companies with limited data-management capacities, by proactively identifying opportunities for targeted disease management initiatives and developing innovative programs in which employers, individually or in groups, can participate.

The key point is that the value of pharmaceuticals cannot be maximized in a vacuum. The arrival of a new drug or treatment regimen is only the first step toward optimizing its effectiveness. There will always be a need to balance the demand for pharmaceuticals and the resources available to pay for them. The question is whether those resources will be used for optimal effectiveness. We all have a role to play in maximizing the return on our investment in pharmaceuticals.
References


10. Ibid.


19. Ibid.


