THE BUSINESS CASE FOR PHARMACEUTICAL MANAGEMENT: A CASE STUDY OF HENRY FORD HEALTH SYSTEM

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FIELD REPORT

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EXECUTIVE SUMMARY

This case study explores two innovations in pharmacy management at the Henry Ford Health System.

This Detroit-based health system experimented with the use of an expensive new drug for treating deep vein thrombosis. Its goal was to prevent or shorten hospitalization for the condition. The study found that the use of this drug—low molecular weight heparin—can reduce hospitalizations, shorten lengths of stay, and lower overall costs by $800 per patient. In effect, there was a compelling business case for the use of the drug, especially for an integrated health system operating with capitated payments.

The second section examines a lipid clinic that was created to maximize the benefit of powerful new cholesterol-lowering drugs. The clinic proved very effective in helping patients achieve desired level of blood lipids, and these patients may avert a heart attack in the future. But potential financial savings generated by the clinic probably will not accrue to the Henry Ford system. It is investing to reduce cholesterol levels in patients who probably will not be enrolled in its health plan by the time any averted heart attack would have occurred.

Background: Low Molecular Weight Heparin

The Henry Ford Health System operates as an integrated health delivery system consisting of a hospital, an affiliated medical group, and a 600,000-member HMO. The medical group accepts "full risk" from the HMO, and ambulatory pharmacy costs are included in the universal risk pool rate.

The medical group views pharmacy policies as an outgrowth of the system's commitment to best scientific practices. One major initiative was a new protocol to use low molecular weight heparin (LMWH) on an outpatient basis for patients with deep vein thrombosis (DVT). This relatively common condition involves clotting in the legs, and is the cause of 300,000 hospital admissions nationwide each year. DVT causes an estimated 50,000 to 250,000 deaths annually as a result of clots that travel to the lungs.

The standard treatment is hospitalization for four or five days for intravenous administration of the anticoagulant heparin, and oral administration of warfarin (Coumadin) for several months.

Program Design

Unlike its predecessor heparin, LMWH can be self-administered by patients subcutaneously. But the medication is still under patent and costs at least $42 more per day than heparin. In December 2000, the Ford system decided to use LMWH in cases where hospitalization could be avoided or shortened. It projected a rapid rise in the use of LMWH over heparin for treating DVT, with a shift in treatment to an outpatient setting. The medical group anticipated the savings from avoided admissions would more than offset higher medication costs. However, physicians were slow to adopt LMWH because of the complexity of the treatment plan. It was decided that if emergency room protocols were revised, home care of DVT would be easier for both physicians and patients.

Health Benefits

Patients do best treated at home. Physicians believe this new outpatient treatment protocol is appropriate for most patients with DVT, and the health system will continue to use LMWH whether or not it is cost effective. Among new cases of DVT treated with the LMWH protocol, about one-half avoided hospitalization and one-half had their length of stay shortened by two days (Exhibit A).

Potential Savings and Costs

When DVT patients were treated with LMWH instead of heparin, length of stay was lower by 2.29 days and the average cost per admission lower was $864 less. Many insurers do not cover LMWH. A system that is not fully integrated and that does not control its own pharmacy benefit would receive no financial benefit from this LMWH protocol.

Background: Lipid Clinic

Use of a new group of expensive drugs known as "statins" has skyrocketed. With proper monitoring, the use of statins can prevent repeat heart attacks and death. But many patients use statins ineffectively. If patients are not monitored carefully, they are using costly and risky drugs with little gain.

For example, a 1996 study of 265 patients on statins showed that only 53 percent achieved desired levels of cholesterol and 43 percent were overdue for liver studies (liver damage is a common serious side effect).

Program Design

At Henry Ford, nearly half of patients treated with statins were receiving potentially toxic drug therapy without any benefit (Exhibit B). The medical group responded by creating a lipid clinic that would review charts, identify necessary tests, and modify the drug regimen when appropriate.

After initial success, the lipid clinic model was expanded to serve about 800 patients. But further expansion was hampered by lack of automation to support the process of monitoring blood levels. The health system obtained a grant to develop and evaluate a computer-assisted workflow decision algorithm.

Health Benefit

At the end of one year, 84 percent of all patients achieved their cholesterol level goals. These patients have better health and longer life expectancy.

Potential Savings and Costs

The direct cost of running the lipid clinics is $145 per patient annually. The cost benefits they generate are in the form of avoided admissions, not direct savings. Direct expenses for 2,000 patients were $291,210. Estimated savings for those patients was more than $900,000.

But only 60 percent of the clinic patients were enrollees in Henry Ford's HMO for whom the health system was at full risk. For these patients, annual drug costs were on average $125 higher per patient. There were theoretical savings of $717 per patient in the form of avoided costs. For the 40 percent of patients who were not members of the HMO, there is some reimbursement for laboratory tests, but no cost savings for the hospital and no reimbursement for monitoring.

The lipid clinics have high direct costs, and Henry Ford will not expand them. That decision means the system will continue to spend between $5 and $6 million annually to achieve therapeutic goals that are not attained.

The appropriate use of statins requires higher administrative costs in order to reap long-term benefits and savings. Even though savings can be expected from the lipid clinic program, these occur in a large pool of insurance costs and are hard to identify and capture for reinvestment in the program.

Exhibit ES-1. Comparison of Patients Treated vs. Those Not Treated with LMWH

	Average Cost per Admission	Average Length of Stay (Days)
Patients treated with Lovenox	$824	3.40
Patients not treated with Lovenox	$1,688	5.69
Net average savings	$864	2.29

Source: Authors' analysis.

Exhibit ES-2. Wasted Cost: Patients Treated but Not Monitored for Results

Factor	Patients	$ (millions)
Total treated with statins HFHS 1996	11,254	$6
47% not at goal lipid level	5,289	$2.82
Direct cost of statin drugs		$2.82
Cost of managing drug-related complications		$2.8–$3.7
Total cost of undertreatment (waste)		$5.6–$6.5

Source: Authors' analysis.

THE BUSINESS CASE FOR PHARMACEUTICAL MANAGEMENT: A CASE STUDY OF HENRY FORD HEALTH SYSTEM

Introduction

Costs of pharmaceuticals are currently the fastest-growing component of health care spending in the United States. Recent innovations in drugs have made an enormous difference in our ability both to treat and prevent disease—but that ability has a high price tag. This case study explores two specific innovations in ambulatory pharmacy management within the Henry Ford Health System (HFHS), a fully integrated delivery system that owns its own managed care plan. The two examples were chosen from among many other pharmacy innovations that have been undertaken recently in the Henry Ford system because they illustrate important and unique points about the benefits and risks of improved pharmacy management. In the first instance, we explore the impact of a decision to make an expensive new drug, low molecular weight heparin, available to treat deep vein thrombosis with the aim of preventing or shortening hospitalization. In the second, we look at an organized "lipid clinic" aimed at ensuring that maximum benefit is obtained from the powerful cholesterol-lowering drugs now on the market.

Background and History

The Henry Ford Health System is an integrated delivery system centered around its flagship hospital, Henry Ford Hospital (HFH), the affiliated Henry Ford Medical Group (HFMG), and an HMO called the Health Alliance Plan (HAP). Built in 1915 in downtown Detroit by the auto magnate Henry Ford, the Henry Ford Hospital has been for many years a prestigious institution that maintains a close alliance with the University of Michigan and sponsors extensive teaching programs. The hospital has always operated on a closed staff model; only members of the Henry Ford Medical Group can admit patients and a single board has always controlled both entities.

Beginning in the 1960s, businesses and affluent residents began migrating out of the center city. Henry Ford's downtown location became a major handicap, with increased numbers of the uninsured taxing the hospital's resources. Under the leadership of the previous CEO, Stanley Nelson, Henry Ford in 1975 began developing an extensive network of suburban ambulatory care centers for the physicians of the Henry Ford Medical Group.

In 1978, in collaboration with the Ford Motor Company and the United Automobile Workers (UAW), the Henry Ford system began development of an HMO, which came to be called the Health Alliance Plan. A relatively small, local plan, originally

started by Walter Reuther of the UAW and known as Metro Health, was folded into the new, larger HMO. HAP, which has now grown to 600,000 members, became a subsidiary of the Henry Ford System in 1986. At the same time, a process of acquisition of and alliance with community hospitals and new medical groups was undertaken. The current CEO of HFHS, Gail Warden, arrived in 1988. He undertook the complex and challenging process of knitting what had been a relatively loose network of affiliated institutions into a genuine integrated delivery system. At around the same time, HFHS also undertook a radical cultural change with the initiation of total quality improvement throughout the organization. That effort, which has been well described in a variety of articles and cases, has led to significant service improvements within both the parent hospital and the affiliates.[1,2] As a result of the dual commitment to quality and diversification, Henry Ford remained financially strong during a period when many other urban academic health centers were struggling. In the mid-1990s, the profitable Health Alliance Plan was able to respond to employer demands for minimal rate increases, a gesture which seemed wise at the time but is now viewed by many within the system as leaving rates in need of aggressive "catch up." Only in 1998, following the passage of the Balanced Budget Act, did the organization as a whole begin to experience losses. These losses increased steadily over the next two years due to a variety of factors, including most notably the acceleration in health care costs experienced by all systems, the continued limits on Medicare's payment update process, and a drop in the rates paid to Michigan's Medicaid managed care plans so extreme that one plan is now in receivership and others are having difficulty paying their bills. Despite growing losses between 1997 and 2000, in late 2001 Henry Ford Hospital remained busy and full and the organization was again engaged in examining ways to reduce operating costs and in rethinking its strategic direction, with an eye to maintaining excellence and improving financial performance.

The Local Market

The health care market in the Detroit metropolitan areas is unusual, compared with most American markets. Together, the automobile manufacturers and their powerful unions dominate health care delivery and health insurance. "I think every major health plan in the country has had a look at this market, and then decided to stay away. It's just too different from what they are used to," Gail Warden says. Significant changes in benefits must be negotiated with the unions rather that simply agreed upon with employers. Henry Ford's Health Alliance Plan is, at 600,000 members, the largest local HMO, with a market share of approximately 20 percent. Blue Cross of Michigan has essentially the entire remainder of the managed care market, and is thus the state's major payer.

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[1] Henry Ford Case Study. 1991. Chicago: APM, Inc.

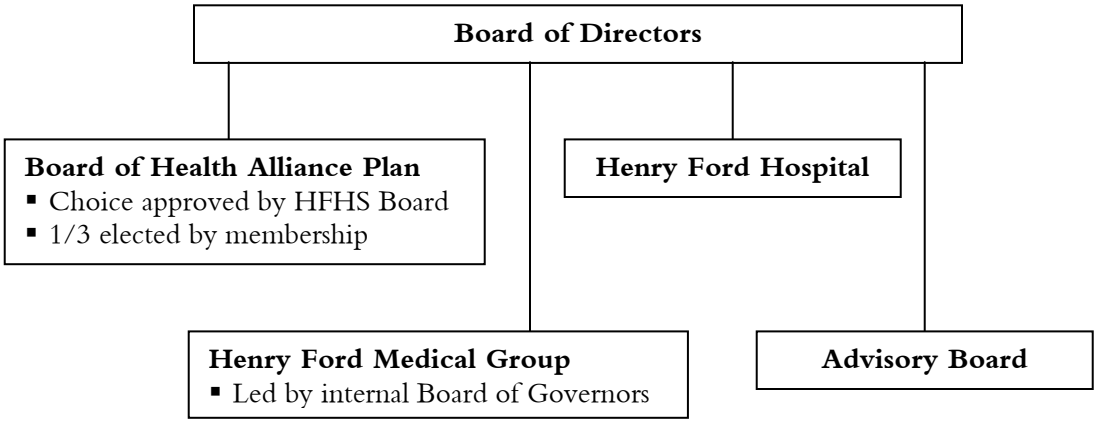
[2] Henry Ford Health System Case Study in J. R. Griffith, V. K. Sahney, and R. A. Mohr, *Reengineering Health Care: Building on CQI* (Ann Arbor: Health Administration Press, 1995, pp. 253–87).

In many of its policies, Health Alliance Plan is driven by union demands. For example, copayments are low and are often not graduated to encourage certain types of behavior. HAP's "Excellent" accreditation rating from the National Committee on Quality Assurance, and in particular its high customer satisfaction results, are very likely due in part to this approach. The system's financial accomplishments during the 1980s through the mid-1990s are even more impressive if one considers that the organization has not made use of consumer-oriented cost control methods, such as variable pharmaceutical copayments, that are in common use in most other settings.

Organizational Structure of the Henry Ford Health System

Although the Henry Ford Health System now includes eight community hospitals and a variety of alliances with physician groups, the focus of this case focuses on the three tightly affiliated major units: the Henry Ford Hospital, its Medical Group, and the Health Alliance Plan. Exhibit 1 shows the relationship of the three units at the Board level: the hospital and medical group are governed by the same board, although each has a subsidiary board of its own. The health plan, under Michigan law, cannot be wholly controlled by the health system; one-third of its board must be elected by the membership.

Exhibit 1. Henry Ford Health System:
Organizational Chart of Principal Units



Source: Henry Ford Medical Group.

Financial Arrangements

Although HFMG's controlling board focuses on performance at the corporate level, results are attributable to specific units. In the last complete fiscal year, the most significant losses were experienced within the physician group in part as a result of their risk arrangement with HAP. The hospital had lower deficits and the plan itself was profitable. To date, corporate funds have been used to cover losses while cost-reduction efforts have continued.

The physician group, for example, has not been asked to make the draconian reductions in physician salaries that have been experienced by at-risk groups in other parts of the country.

Money Flows and Incentives

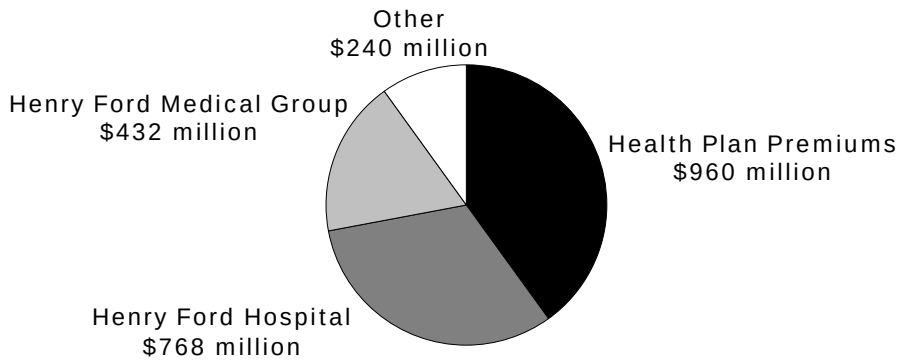
Because health plan, hospital, and medical group operate as an integrated system, agreement is reached on critical business issues on the basis of consensus. Matters that are of critical importance to a given unit, such as where to purchase ancillary tests, are decided at meetings involving the chief financial officers (CFOs) of all units. Many of the resulting practices are not commonly found in more conventional agreements. "When we go to the meetings we are working within the confines of the family," Joe Schmitt, CFO of The Henry Ford Hospital, explains. "This is the way we've done it historically; we all have a system point of view." The nature of the full integration is perhaps best demonstrated by the fact that Schmitt was, until a few days before he was interviewed for this case, the CFO of the Health Alliance Plan. He was asked to move in order to address the hospital's current financial problems. Obviously, in such a situation, there are no secrets—and very little of the "good guy/bad guy" sense that often pervades negotiations among plans, hospitals, and doctors.

Exhibits 2a and 2b trace the flow of dollars through the system at the highest level. The basics of the relationship are as follows:

- The Henry Ford Medical Group has for a number of years accepted "full risk" from the health plan, with approximately 92 percent of premium paid to the physician group annually. Ambulatory pharmacy costs are included in this universal risk pool.
- Plan payments to the Henry Ford Hospital are based on diagnosis related groups (DRGs). This means that the hospital, rather than the at-risk physicians, reaps any financial benefit from decreases in the length of stay. The benefit of an admission that is completely avoided would flow back to the medical group.
- The Health Alliance Plan purchases all ancillaries from Henry Ford for all patients who are members of the Henry Ford Medical Group; the result is relatively high unit costs for laboratory tests and X-rays.
- Approximately 25 percent of hospital revenues and 45 percent of medical group revenues come from HAP. The remainder of the clinical income comes from Medicare (56%) and other payers (30%).
- At the present time, 12 percent of HFHS revenues come from a variety of closely related subsidiaries such as nursing homes, home health services, and dialysis

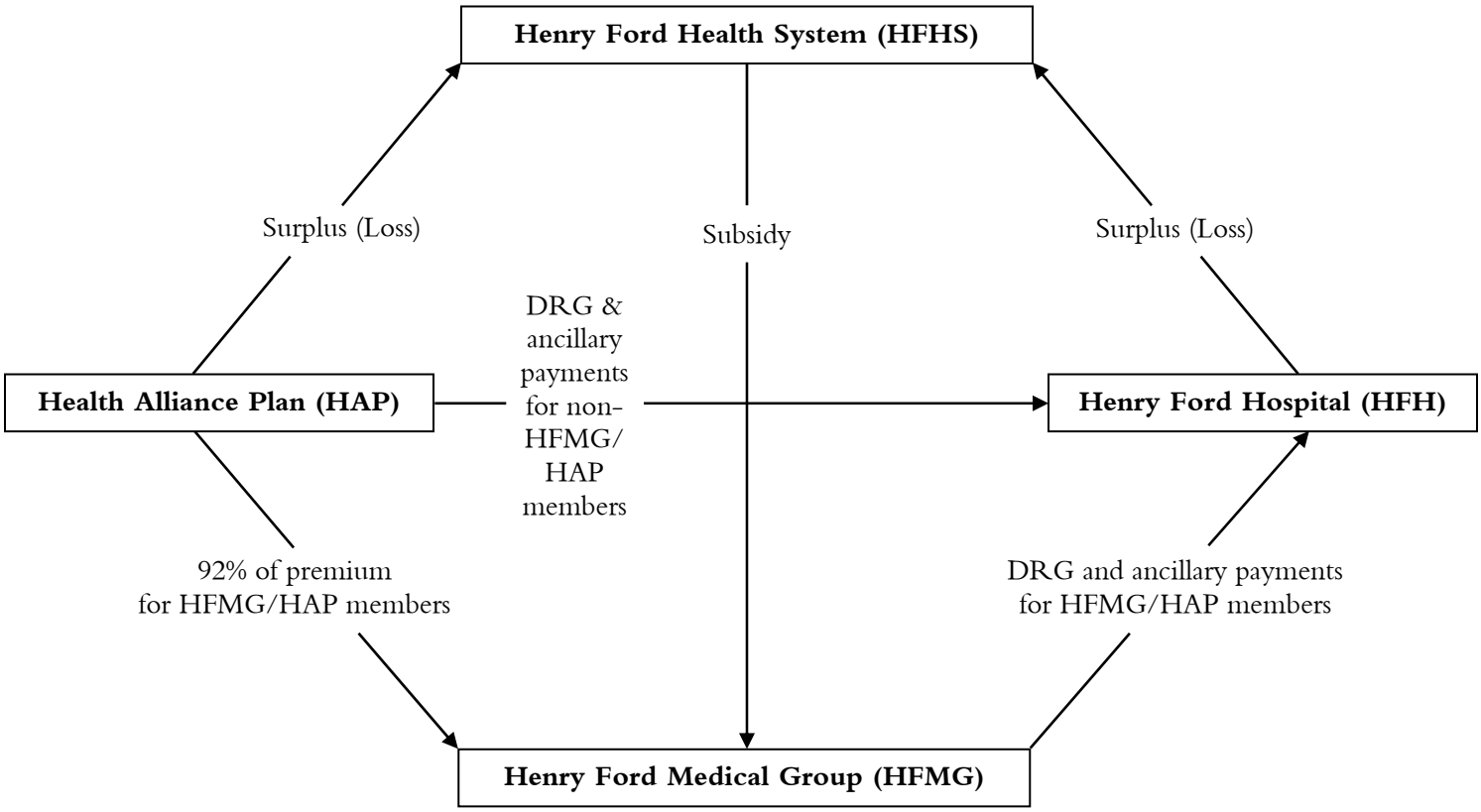
services. Income is derived from investments and additional closely held corporations, such as a very successful optometry service.

Exhibit 2a. Henry Ford Health System: Sources of Revenue



Source: Authors' analysis.

Exhibit 2b. Flow of Funds Between HFHS Entities



Source: Authors' analysis.

Despite the fact that the physician group is at full risk for medical costs, their current incentive plan contains no elements aimed at cost control other an incentive to be productive in the use of their own time. Exhibit 3 shows a sample summary of a physician incentive report; base salary is calculated using an "annualized work effort," an amount that reflects the relative value units (RVUs) of patients seen. Modifications to the base pay are based upon patient satisfaction, "citizenship," and stipends paid for particular activities such as administrative responsibilities and teaching. Citizenship is currently calculated using a scale based entirely on number of years since residency. The incentive to provide patient satisfaction is particularly interesting in the context of outpatient pharmacy; leaders at both HAP and the medical group note the fact that satisfying patients tends to put pressure on the physician to prescribe the most widely advertised drugs when the patient asks for them.

Exhibit 3. Henry Ford Medical Group:
Physician Compensation Data Sheet

Name: Bilbo Baggins

Specialty: Pediatric Medicine

Current Base Salary: 98,000

Region: Eastern

FTE: 1.00

Annualized Work Effort: 2603

Patient Satisfaction Score: 89.42

# of questionnaires:	41
1st Quartile for Specialty:	80.1
3rd Quartile for specialty:	89.1

Work effort-Based Clinical Pay	85,755
+ Patient Satisfaction Adjustment	4,288
= Final Target Clinical Pay	90,043

Final Target Clinical Pay	90,043
+ Citizenship Stipend	5,582
+ Hospitalist Stipend*	7,000
+ Administrative Stipend	0
+ Educational Stipend*	0
+ Other	0
= Total Target Pay	102,625

These stipends are subject to change, depending on amount of time currently devoted to the activity

New Physician Status? No

Work Effort Necessary to Maintain Base Pay: 2469

Six-Month Incentive Award: 2,312

Percent Change in Rate of Total Pay From 1999 4.7%

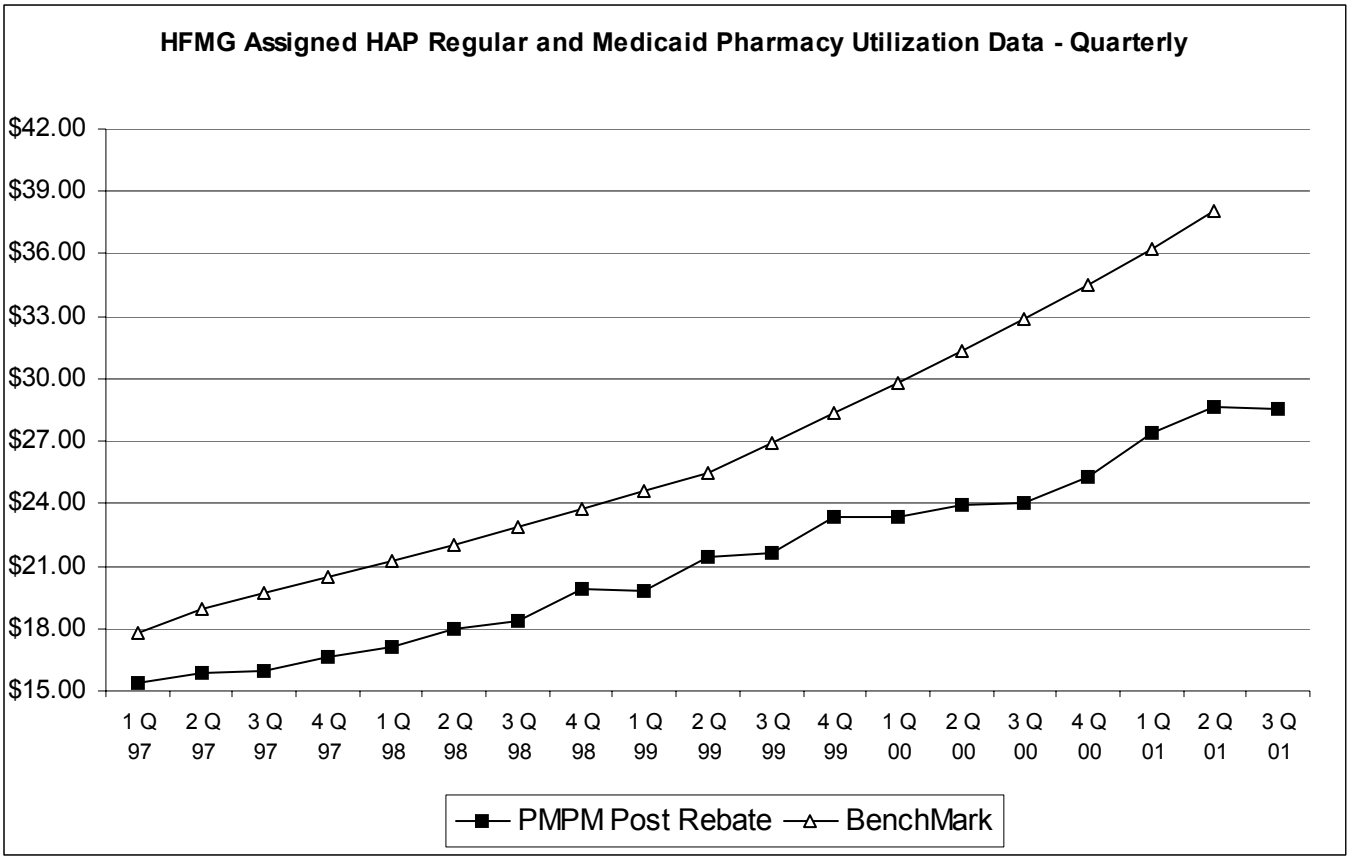
Current Base Salary	98,000
- Pay Reduction	0
= New Base Pay	98,000

Source: Henry Ford Medical Group.

Management of Outpatient Pharmacy Costs

The majority of HAP members are contractually entitled to receive all FDA-authorized drugs. The copayments are minimal and, for the major contracts involving unionized workers, they are not "tiered," so that members pay the same copayment for a generic drug as they do for a much more expensive brand-name version of the same compound. Patients who insist on receiving drugs not on the formulary do not pay any part of the increased cost to the system. In the absence of incentives for either physicians or members to save money, it would seem likely that cost control in the pharmacy benefit would be impossible and that there would be higher-than-average costs for drugs used within the system. In fact, the opposite is true: the formulary costs for members of the plan have consistently been below national benchmarks, and performance relative to benchmarks is in fact improving rather than deteriorating (Exhibit 4).

Exhibit 4. Pharmacy Utilization



Source: Authors' analysis.

A single committee, appointed jointly by HAP and the medical group, serves as the policy and drug review board for outpatient prescriptions. This group, the Ambulatory Pharmacy and Therapeutics Committee (Ambulatory P&T), is clearly seen by its members as an important and interesting assignment. Meetings are well attended and minutes reveal

sophisticated discussions across the full range of therapies. A carefully developed preferred formulary is prepared, promulgated, and monitored through this committee. The standards are rigorous; more drugs are denied admission to the formulary than are accepted. In order to ensure appropriate prescribing, practice guidelines are regularly developed and distributed based on the best available national consensus. The focus of this committee is specifically on making "best value" choices, not merely the lowest-cost ones, and physicians who have a sound reason to request the inclusion of a new drug in the formulary are heard. The committee is willing, however, to address mundane cost issues, such as the value of splitting tablets and the benefits experienced from alternate-day dosing. As a result of the committee's active participation in a rigorously scientific process of formulary development, pharmacy policies are not viewed by the medical group members as externally imposed irritations, but rather as an outgrowth of the organization's commitment to the best scientific practice.

In the absence of incentives or mandates, enforcement of the committee's choices is handled by a data-driven process managed by pharmacy staff. Physician profiling is undertaken on a regular basis, and physicians with poor performance are required to undertake continuing education carried out by medical peers and members of the pharmacy staff. In addition, relationships with drug manufacturers are carefully managed and data systems are used to maximize rebates—an important source of cost savings.

Innovation: Use of Low Molecular Weight Heparin

One of the major initiatives undertaken recently by the Ambulatory P&T Committee has been the implementation of a protocol to use low molecular weight heparin on an outpatient basis for patients with deep vein thrombosis (DVT). DVT is a relatively common and dangerous condition involving blood clots in the deep veins in the legs. Nationally, approximately 300,000 admissions per year are attributed to DVT, and it is estimated to cause between 50,000 and 250,000 deaths annually as the result of blood clots that travel to the lungs (pulmonary emboli).[3] The condition can be seen in anyone; it commonly occurs in individuals who are inactive for long periods such as those recovering from orthopedic procedures and those who travel extensively on airplanes or who have jobs such as truck driving. Treatment of DVT has essentially been unchanged for close to 50 years: anticoagulation is begun immediately with heparin and continued for an extended period with warfarin, a drug commonly referred to by its original brand name, Coumadin. Heparin must be injected and warfarin is taken by mouth. Both carry some

[3] J. Hirsh and J. Hoak, "Management of Deep Vein Thrombosis and Pulmonary Embolism. A Statement for Healthcare Professionals. Council on Thrombosis (in consultation with the Council on Cardiovascular Radiology), American Heart Association," *Circulation* 93 (June 15, 1996): 2212–45.

risk of severe and even fatal bleeding, so that patients using these medications must be monitored with regular laboratory tests.

Heparin works by enhancing the body's own natural defenses against excess clotting. It inhibits clotting factors and also actually speeds up the body's natural tendency to resolve clots. It therefore contributes to the resolution of existing clots while preventing formation of new clots. It is effective immediately when injected and must be given again at least every eight hours. Warfarin achieves optimal power only over several days and its effects linger for some days after the drug is stopped.

The standard treatment for DVT has involved admitting the patient to the hospital for the intravenous administration of heparin. Warfarin is also begun immediately and is continued for a period of several months. Patients are typically discharged after four to five days, at the time when the effects of warfarin can be observed. Heparin is discontinued at discharge. There are only a few circumstances, such as clotting occurring during pregnancy, when heparin is used for long-term treatment. Both drugs were discovered more than 40 years ago, and the cost of a daily dose is approximately $2.00 to $3.00 for heparin and $0.50 to $0.75 for warfarin.

Low Molecular Weight Heparin

Heparin became much easier to use in the late 1990s with the introduction of purified low molecular weight heparins (LMWHs). These are modified heparins of a smaller, more consistent molecular weight. They can be administered subcutaneously and thus may be self-administered by patients. The primary outpatient use of these medications has been for patients who are already anticoagulated and are planning to undergo surgery; warfarin is discontinued and LMWH used during the perioperative period—a short time before and after surgery. The drug is also used to prevent deep vein thrombosis in patients with no history of clotting who are undergoing high-risk procedures, such as hip replacement.

LMWHs have a safety profile and complication rate very similar to heparin itself. The advantage found in ease of administration has to be weighed against the much higher cost of the drug, which is still under patent. The cost per day for Lovenox, the brand of low molecular weight heparin used at Henry Ford, is $45 to $50.

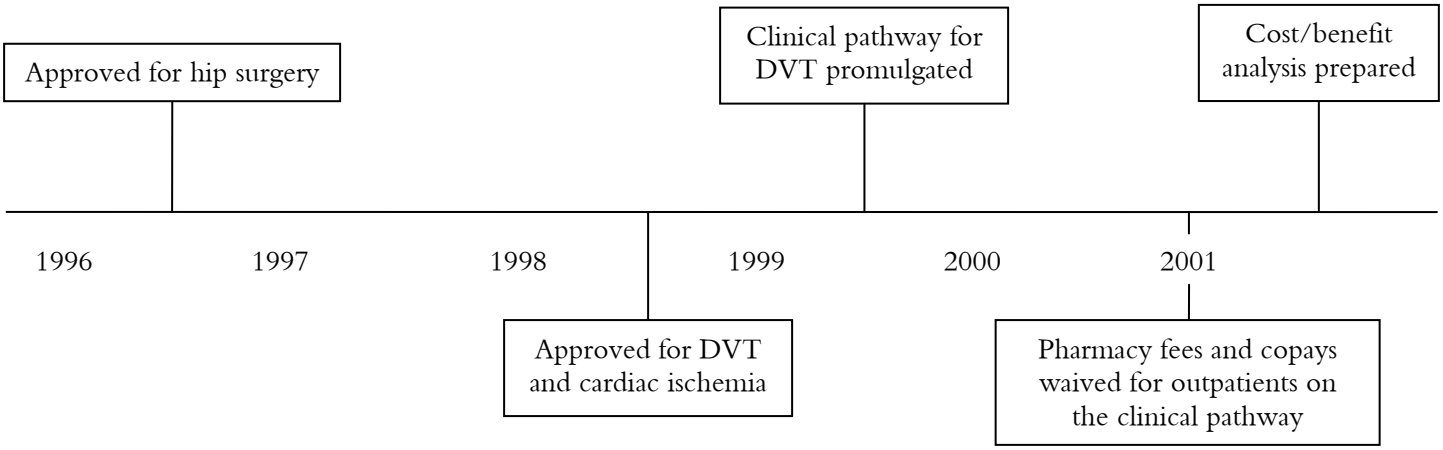
Another element appears to affect physicians' willingness to use LMWH: the laboratory monitoring that is standard for heparin is not required for LMWHs. Heparin administration is monitored by means of a test known as the aPTT, which measures thrombin activity. Since thrombin is much less affected by LMWH, aPTT testing is not

required. The only alternative test is a study of the anti-factor Xa concentration, which is a much more expensive and difficult laboratory test, unsuitable for widespread monitoring.

Dr. Mumtaz Ibrahim, a Health Alliance Plan medical director involved in monitoring the use of Lovenox, observes, "Doctors believe because they don't have to do the laboratory tests, this drug must be safer. In fact, it's not; the safety profiles of the two kinds of heparin are essentially identical."

Exhibit 5 shows the timeline for the introduction of Lovenox within the Henry Ford system. The formulary committee originally approved Lovenox in 1996 for use in patients about to undergo hip surgery. In 1998, approved use was expanded to include those cardiac ischemic syndromes that could be treated on an outpatient basis and DVT. At the time, the possibility of DVT treatment being used to avoid hospitalization was considered. In 1999, a clinical pathway for the use of Lovenox in DVT was developed with the intention of encouraging both outpatient use of the drug and early discharge; one physician member of the committee estimated that between 400 and 500 patients per year could either avoid admission or be discharged early.

Exhibit 5. Timeline of Lovenox Introduction at Henry Ford Health System



Source: Authors' analysis .

A year later, in December 2000, a series of coverage decisions was made to facilitate the use of the drug for Health Alliance Plan patients with DVT. When hospitalization can either be avoided or shortened, LMWH is covered whether or not the member has pharmacy coverage. No copayments are owed, and patients who have a limit on drug coverage do not have the drug charged against that limit. These rules hold only for the five days of traditional treatment with heparin; longer treatment requires prior authorization.

The expectation was that these rules would lead to a rapid increase in the use of LMWH as a substitute for conventional heparin in the treatment of DVT and to an equally rapid shift of DVT treatment to the outpatient setting. The medical group anticipated savings from avoided admissions that would more than offset the increased cost of the medication. The actual available numbers do not show that this was the result, at least during the first six months after the favorable pharmacy policies became official.

Exhibit 6 shows the results of the new protocol for DVT patients. The total number of cases in which Lovenox was used for DVT treatment rose only modestly in the first six months of 2001—from 23 patients in January to 29 patients in June. It is not clear yet whether this is a true trend or only random variation. However, days of therapy and therefore costs fell quite markedly, presumably because a clinical pathway requiring prompt initiation of warfarin therapy was followed carefully. If we assume that, as a result of the protocol, half of all new cases avoided hospitalization and half had their length of stay shortened by two days, we can see that the net savings are as shown in Exhibit 6. The total estimated savings would be approximately $22,000—savings that can be anticipated to increase over time as physicians become more comfortable with both early discharge and avoidance of hospitalization in these patients. The increased drug costs for Lovenox for non-DVT patients came to $23,352—essentially eliminating the cost benefit achieved through the use of Lovenox in DVT. The ease of use of the drug and emerging support in the literature for additional outpatient uses, coupled with the belief that it must be safer because recommended blood testing is less, appears to have encouraged physicians to use the medication for a wide range of therapeutic indications, resulting in an overall increase in cost.

Exhibit 6. DVT Patients' Use of Indicated LMWH Following Protocol Implementation

(January 2001–June 2001)	
Hospitalizations avoided: 3 @ $3,500 per case	$11,500
Hospital days reduced: 6 @ $500 per day	$ 3,000
Reduced drug costs	$ 7,500
Total	**$22,000**
Annualized impact	$44,000

Source: Authors' analysis.

Exhibit 7 presents an alternative analysis of the costs and benefits of Lovenox. We reviewed the results for all health plan patients admitted to Henry Ford Hospital with a DVT-related primary diagnosis (453.8 or 451.11) for the 10-month period from January 1, 2001, through October 30, 2001. The aim was to determine whether or not use of the

Lovenox protocol affected length of stay and decreased costs for inpatients when compared with patients on conventional therapy. Exhibit 7 shows that the length of stay was 2.29 days less and the average cost per admission $864 less for DVT patients treated with LMWH compared with those not treated with LMWH. We excluded one outlier case where Lovenox was used and the total charges for the admission were nearly $37,000. This was a complex patient who was not managed by the Lovenox protocol, and the reasons for administering the drug throughout such a long stay were not identified in the records.

Exhibit 7. Comparison of Patients Treated vs. Those Not Treated with LMWH

	Average Cost per Admission	Average Length of Stay (Days)
Patients treated with Lovenox	$824	3.40
Patients not treated with Lovenox	$1,688	5.69
Net average savings	$864	2.29

Source: Authors' analysis.

There were no overall marginal savings for hospital, ancillary, and pharmacy charges associated with inpatient LMWH treatment due to the excessive costs for the single outlier case. Limitations of this analysis include exclusion of indirect benefits of Lovenox treatment, exclusion of savings on avoided admissions, and the fact that these data are not adjusted to account for differences in the complexity of cases treated with and without LMWH therapy.

The relatively slow adoption of the use of Lovenox for DVT at first appears puzzling in view of the fact that the drug is already in wide use for other purposes in the Henry Ford System and that the financial incentives are well aligned to encourage LMWH use in DVT. A review of the theory of the diffusion of innovations, however, helps to explain the current situation. Rogers defines innovation as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption."[4] The use of Lovenox, according to this definition, is not one innovation but several. These are: the use of LMWH for prevention of clotting during orthopedic surgery, which was introduced into the Henry Ford system in 1996 and has already been widely adopted; the use of LMWH for treatment of DVT on an outpatient or short-stay basis, which is being adopted relatively slowly; and the use of LMWH for a cluster of other purposes such as cardiovascular disease and treatment during pregnancy, where adoption is occurring more rapidly.

[4] E. M. Rogers. *Diffusion of Innovations* (New York: Free Press, Fourth Edition, 1995).

Rogers defines five factors that explain both the likelihood of adoption of an innovation and the relative speed of adoption. These are: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage is the degree to which an innovation is perceived as better than the idea or practice it supersedes. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption will be. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters. More compatible innovations are adopted more rapidly and easily. Complexity is the degree to which an innovation is perceived as difficult to understand and use. Some innovations are readily understood by most members of a social system; others are more complicated and will be adopted more slowly. Trialability is the degree to which an innovation may be experimented with on a limited basis. Observability is the degree to which the results of an innovation are visible to others.

The different uses of Lovenox are similar in terms of relative advantage, trialability, and observability. They differ markedly from one another, however, in terms of compatibility and complexity. Both orthopedic use and the cluster of other uses are relatively straightforward changes in existing practice. A drug that is relatively easy to use, perceived as safe, and has the convenience of self-administration is in these cases substituted for another drug without any other significant change in practice patterns. The proposed treatment of DVT, however, involves complex changes in practice that are not compatible with existing attitudes toward the appropriate treatment of this life-threatening illness. Patients who were formerly cared for by nurses and observed closely in a hospital bed are now on their own, administering medication at home. The responsible physician has much less assurance that the drug will be administered properly and that the patient will remain free of complications. As a result, the innovation involved in using DVT is being adopted more slowly than are other innovative uses of the drug.

This analysis suggests that use in DVT can best be encouraged by revising Emergency Room protocols to make home care of DVT as easy as possible for physicians and as safe as possible for patients. Ease of testing for DVT in the Emergency Room and protocols for nursing telephone follow-up are two strategies that would appear to have the most potential in terms of making the innovation less complex, more compatible, and therefore more likely to be adopted.

The members of the Pharmacy and Therapeutics Committee remain committed to the concept that LMWH can, and should, be used to treat DVT and that this treatment should be done on an outpatient basis. A "dog and pony show" regarding the appropriate

use of LMWH has been developed and is being presented by one of the medical directors of HAP to all of the medical groups within the system. In addition, consideration is being given to whether admission of DVT patients is continuing because the critical tests to make the diagnosis are not always available in the Emergency Room. Pharmacy staff now believe that a significant reengineering of work flows in the Emergency Room will be needed in order to realize the full potential of the clinical pathway. The decision to press on with the innovation is driven not just by the hopes for cost savings but also by a belief that the new protocol is the best way to operate. "This is the right thing to do," Dr. Ibrahim says. "It fits the modern lifestyle. It's right financially, socially, and from a safety point of view. People are better off outside of the hospital; this protocol is appropriate for the vast majority of patients with this condition." All involved anticipate continued growth in the use of Lovenox and steadily increased use of the protocol. The plan is to continue use of the drug whether or not it proves cost effective.

Innovation: Lipid Clinics to Make Prevention Work

Patients with coronary artery disease, as well as those with high serum cholesterol values but no overt disease, have been shown to benefit from the appropriate use of a group of relatively new drugs known as HMG-coA reductase inhibitors or, more colloquially, as "statins." Five statins are currently on the market, each with a sufficiently different molecular structure to permit separate patents. Three of these drugs—atorvastatin, pravastatin, and simvastatin—are included in the HFMG ambulatory formulary; simvastatin, also known by the brand-name Zocor, is the HFMG preferred drug. All three are very expensive, with daily doses costing in the range of $1.75 to $2.60 and resulting in an average annual per patient cost to HFMG of $675. The drug must be continued indefinitely to have benefit.

The literature is now very clear on the advantages of using these drugs, provided that blood lipids are brought within the desired range. Particularly for cardiac patients, there is clear evidence that complications such as repeat heart attacks may be avoided and mortality reduced.[5] Although statins are easy to use, it is difficult to optimize their effectiveness. Ideally, patients should modify diet and lifestyle to maximize the benefits of the drug. They also must be monitored closely to be sure that the therapeutic goals have been reached and that there are no signs of liver damage, the most common serious side effect of the drugs. Although the drugs have come into wide use, there is considerable

[5] www.nhlbi.nih.gov/guidelines/cholesterol/. Accessed 1/3/02.

evidence that they are being used ineffectively—that is, they are being administered without sufficient monitoring of results.[6]

In recent years, HFMG, like many large group practices, has seen rapid growth in the use of statins. The results, in terms of actual achieved lowering of lipids, were initially not particularly impressive. In 1996, a study of 265 statin-receiving patients in one region showed that only 53 percent had reached the desired LDL-cholesterol goal, while 43 percent were overdue for liver studies and 27 percent had not had appropriate follow-up lipoproteins. These results are actually better than those found in a multicenter lipid treatment assessment project, in which only 38.4 percent of all patients achieved their LDL-cholesterol goals.[7]

Thus, nearly half of statin-treated patients at Henry Ford were receiving potentially toxic drug therapy without resulting benefit. Given estimates that for every dollar spent on drug therapy, another dollar is spent managing the complications of drug therapy, HFMG was spending between five and six million dollars to achieve an outcome that was never reached (Exhibit 8).[8]

Exhibit 8. Wasted Cost: Patients Treated But Not Monitored for Results

Factor	Patients	$ (millions)
Total treated with statins HFHS 1996	11,254	$6
47% not at goal lipid level	5,289	$2.82
Direct cost of statin drugs		$2.82
Cost of managing drug-related complications		$2.8–$3.7
Total cost of undertreatment (waste)		$5.6–$6.5

Source: Authors' analysis.

The Henry Ford Medical Group decided to establish a pilot "lipid clinic," which originally consisted of a single pharmacist working eight hours per week to review charts, identify needed tests, counsel patients as needed, and modify the drug regimen when appropriate. A formal protocol was developed that permitted the pharmacist to modify drug doses as needed (Exhibit 9). At the end of one year, the results of the pilot showed

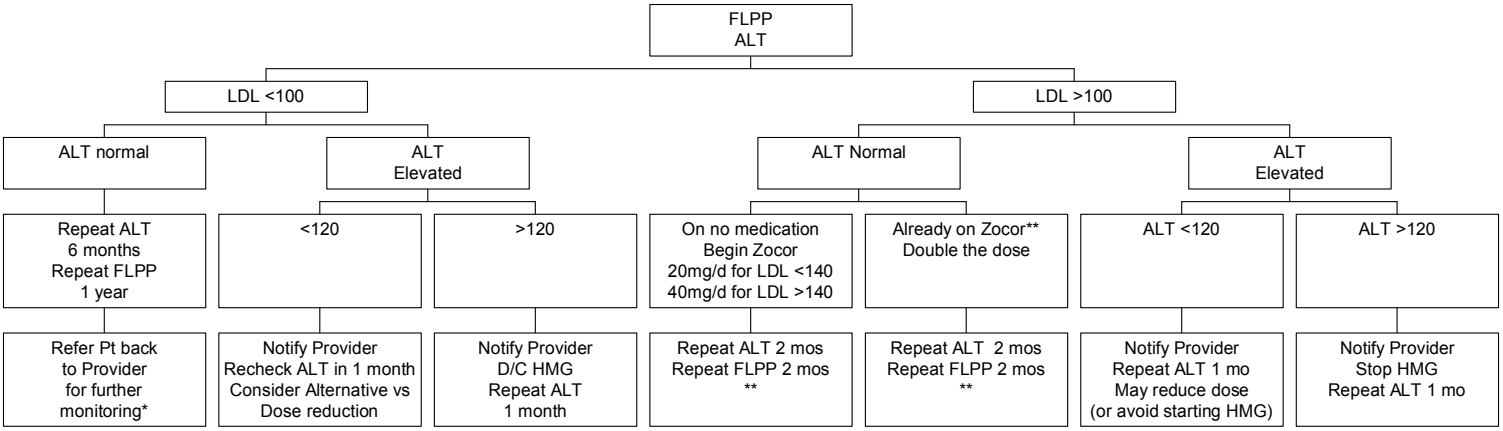
[6] S. A. Abookire, A. S. Karson, J. Fisko, and D. W. Bates, "Use and Monitoring of 'Statin' Lipid-Lowering Drugs Compared with Guidelines," *Archives of Internal Medicine* 161 (January 8, 2001): 53–58.

[7] T. A. Pearson, I. Laurora, H. Chu, and S. Kafonek, "The Lipid Treatment Assessment Project (L-TAP): A Multicenter Survey to Evaluate the Percentages of Dyslipidemic Patients Receiving Lipid-Lowering Therapy and Achieving Low-Density Lipoprotein Cholesterol Goals," *Archives of Internal Medicine* 160 (February 28, 2000): 459–67.

[8] J. A. Johnson and J. L. Bootman, "Drug-Related Morbidity and Mortality: A Cost-of-Illness Model," *Archives of Internal Medicine* 155 (October 9, 1995): 1949–56.

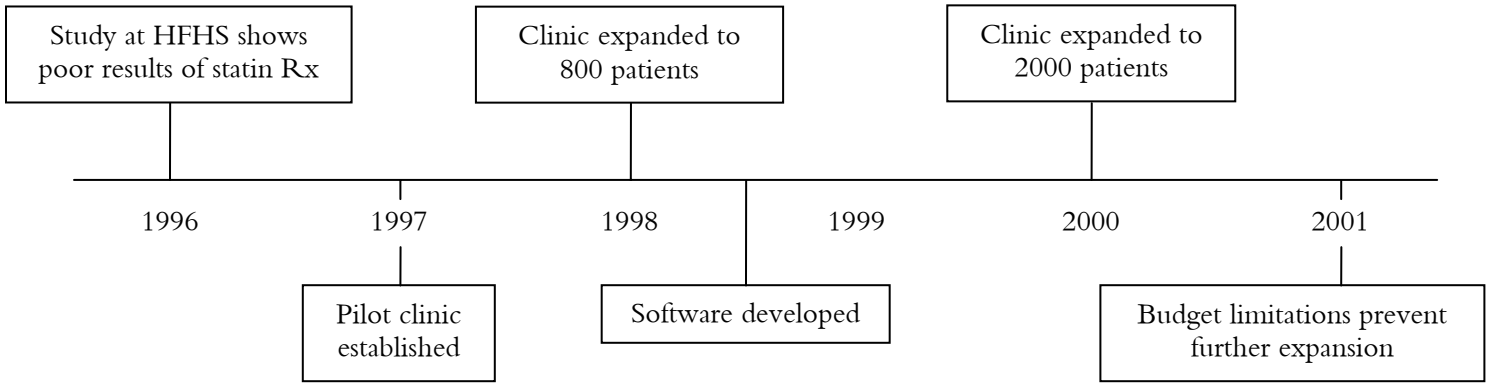
that 84 percent of all patients were able to achieve their LDL cholesterol-lowering goals. The clinic was continued in a single region and expanded to include approximately 800 patients. The timeline for clinic expansion can be found in Exhibit 10.

Exhibit 9. Lipid Clinic Protocol



Source: Henry Ford Medical Group.

Exhibit 10. Lipid Clinic Timeline



Source: Authors' analysis.

At this point, it became apparent that further expansion would be very difficult in the absence of an automated system to support the process of monitoring blood levels and ensuring that all appropriate tests were done. HFMG was able to obtain a grant to develop and evaluate a computer-assisted workflow decision algorithm to ensure adherence to guidelines. Once this system had been developed and tested, the medical group was ready to expand its clinics to other regions. The existing clinic has continued to flourish; in 2001 the American Medical Group Association awarded it an "Acclaim Award" for its outstanding success rate.

Even after winning this national prize, the clinics have not been expanded because of a major obstacle—costs. In a period of budget stringency, the system as a whole has had difficulty releasing funds to support this innovation, even though its benefits are clear. The reason can be seen in Exhibit 11. Put simply, the clinic generates direct costs; the savings that result, although large in number, are indirect (in the form of avoided admissions) and cannot easily be identified or captured to support expansion. At the beginning of 2001, an analysis showed direct expenses for 2,000 lipid clinic patients of $291,210. An analysis was conducted at the same time for a fully implemented clinic of 10,000 patients, in which direct expenses were anticipated to be $1,456,050. Estimated savings for the 2,000-patient clinic were over $900,000; those for the 10,000-patient clinic would be five times as large. It should be noted that there are a number of indirect costs, including the cost of space and general overhead, which HFMG chose not to include in this marginal cost analysis.

Only approximately 60 percent of these patients will be members of the Health Alliance Plan and therefore individuals for whom the medical group, and ultimately the health system, carries risk. For these patients, there will be increased drug costs of approximately $125 per patient per year on average (since the better results are usually achieved by using a greater amount of the drug). At the same time, there are theoretical savings of $717 per patient in the form of costs that would have been associated with treating complications had the patients not been treated at all. Perhaps the best argument for system-wide implementation of the lipid clinics is the cost associated with treatment for the 47 percent of patients who never attain target LDL cholesterol values.

An additional source of savings can be found in the form of reduced physician time spent in patient counseling. Exhibit 11 shows another of the dilemmas that HFMG faces: for the 40 percent of patients who are not members of the Health Alliance Plan, there is some reimbursement in the form of payment for laboratory tests, but no source of savings—even theoretical savings—to offset the costs of the clinic. Any benefits from reduced hospitalizations will accrue to the patients' current insurer. At present, the lipid clinics have been expanded to include only approximately 1,600 patients. The results of this intervention are shown in Exhibit 12, which demonstrates a steady improvement in the lipid levels achieved by those participating in this clinic. Plans for continued expansion are on hold, but the expectation is that the clinics now functioning will continue to operate.

Exhibit 11. Henry Ford Medical Group: Lipid Control—Financial Summary

Salaries and Benefits	FTEs	Total $	Per Patient per Year
Direct expenses (2,000 patients)			
Pharmacist	1	$ 70,000	$ 35.00
RNs	3	$120,000	$ 60.00
Benefits @ 25%		$ 47,500	$ 23.75
Laboratory test			
Point of care		$ 40,000	$ 20.00
Liver Function Tests		$ 8,000	$ 4.00
Other		$ 5,170	$ 2.58
Total direct expense		$291,210	$145.60
Increased drug costs (HAP only)		$250,000	$125.00
Total new expense		$541,210	$270.60
New revenues (laboratory test for non-HAP patients)			
Point of care		$ 32,000	$ 16.00
Liver Function Tests		$ 6,400	$ 3.20
Total new revenues		$ 38,400	
Avoided costs		$1,434,000	$717.00
Savings and revenue		$1,510,800	$755.40
Net benefit		$969,590	$484.80

Source: Henry Ford Medical Group.

Exhibit 12. Henry Ford Medical Group:
Lipid Clinic—3rd Quarter and Year-to-Date Summary

Quality Indicator: Coronary Artery Disease Patients Achieving LDL-Cholesterol Goal

THIRD QUARTER

Region	No. of Patients	At LDL-C Goal	% at Goal
NE Region	1058	794	77.3%
NW Region	422	352	83.4%
WES Region	48	352	68.8%
DR Region	18	12	66.7%
DET Region	85	61	71.8%
Totals	**1631**	**127**	**78.3%**

YEAR-TO-DATE SUMMARY:
% OF PATIENTS ACHIEVING LDL-CHOLESTEROL GOAL

Region	1stQ2001	2ndQ2001	3rdQ2001
NE Region	70.0%	75.2%	77.3%
NW Region	73.6%	80.2%	83.4%
WES Region	50.0%	56.6%	68.8%
DR Region	37.5%	64.7%	66.7%
DET Region	N/A	64.3%	71.8%
Totals	**69.9%**	**75.6%**	**78.3%**

Source: Mary Bloome, R.Ph., Clinical Pharmacy Specialist, Lakeside Internal Medicine, October 10, 2001.

Policy Conclusions

The two clinical innovations described here reflect quite different patterns of costs, savings, and benefits. For purposes of this discussion, costs are defined as any new expenses needed to initiate the improvement, savings are economies within the health system that result from that improvement, and benefits are less tangible results such as patient convenience, safety, and improved health that arise from the improvement. Benefits may also accrue to employers (from the improved health of employees) and to other parts of the health system in terms of increased availability of resources such as beds and nursing hours for use by other patients. This discussion focuses primarily on costs and savings.

The use of Lovenox both adds and reduces costs within the insurance benefit; its effects, in terms of savings and of other benefits, are experienced in the short term. The appropriate use of statins, by contrast, involves increasing administrative budgets in order to experience long-term benefits and savings within the insurance benefit. Since the benefits to patients successfully treated with lipid-lowering drugs accrue slowly over time, the savings may actually be experienced by a health insurance plan other than the one who initially covers the patient.

Lovenox

Exhibit 13a illustrates the location of increased cost and increased savings for the most common insurance arrangements within the Henry Ford Health system. Less tangible benefits are not included. As noted above, these benefits are experienced by the patient in the form of both personal convenience and safety, by the hospital in the form of more bed availability, and by the physician group in the sense of being able to admit other patients. It should be remembered that the ratio of cost to savings is approximately 1 to 5. The first part of Exhibit 13a shows who pays and who gains when the patient with DVT is not admitted to the hospital. It is of interest to note that, in all cases except for patients with conventional Medicare and no pharmacy benefits, the same individual or group that experiences the savings pays the new costs. The only other case where this is not true is shown in the lower half of the table where, in the case of patients within HFMG's risk pool who are admitted but discharged early, the medical group pays the extra costs of the drug and then also pays the full Diagnosis Related Group to the hospital. Although this arrangement causes concern to many HFHS staff, it is in fact a relatively minor aberration in what is overall a benefit package and risk arrangement that encourages innovation and high-quality care.

Exhibit 13a. Henry Ford Health System:
Alignment of Incentives in Lovenox Use

+ Savings – Costs

		Hospital	**Medical Group**	**Plan**	**Pharmacy Benefit Manager**
As planned (no admission)	Henry Ford Medical Group		+ –		
As planned (no admission)	HAP			+ –	
As planned (no admission)	Medicare			+	–
As planned (no admission)	Other			+ –	
Admission	Henry Ford Medical Group	+	–		
Admission	HAP			+ –	
Admission	Medicare			+	–
Admission	Other			+ –	

Source: Authors' analysis.

Exhibit 13b shows the effects of Lovenox, in terms of both cost and savings, in more conventional settings. Four types of insurance arrangements are shown: capitation or

fee-for-service with no risk sharing; capitation or fee-for-service with risk sharing on hospital costs, no pharmacy benefit; and risk sharing for both hospital and pharmacy costs. One additional column has been added to reflect the fact that risk for pharmacy costs is often passed on to, or shared with, a pharmacy benefits manager. The assumption in all cases is that the plan will share that risk with the pharmacy benefits manager.

Exhibit 13b. Henry Ford Health System: Alignment of Incentives in Lovenox Use—Other Payment/Reimbursement Scenarios

+ Savings – Costs

No Admission	Hospital	Doctors	Plan	Pharmacy Risk	Patient
Capitation, no risk share			+	–	–
Risk share for hospital		+	+	–	–
No drug coverage			+		
Risk share for hospital and pharmacy		+ –	+	–	

Source: Authors' analysis.

These results are strikingly different than those seen within HFMG. In almost all of the conventional insurance arrangements, the higher cost of Lovenox will be borne by a unit that has no potential to share in the resulting savings. It is actually hard to estimate whether any system that is not fully integrated and controls its own pharmacy benefit would be interested in or able to engage in this particular innovation. The traditional response on the part of a pharmacy benefit manager to a demand for a drug such as Lovenox would be to require pre-authorization and a substantial patient copayment. Many national insurers do not cover LMWH at all.

In a general sense, the problem illustrated in Exhibit 13b is one that arises whenever a series of separate, actuarially calculated "risk pools" are used to set incentives: any innovation that transfers costs from one risk pool to another will be difficult to achieve, even if substantial overall benefit and savings may be experienced as a result. This phenomenon is most commonly seen within the care provided to mentally ill and substance abusing patients, where costs of drugs and costs of other treatments are often handled by separate subcontractors with separate incentives. It is hard to define what policy changes could be undertaken to lessen the impact of this kind of problem, since much of the difficulty arises from individual contracts entered into by independent organizations. It is also sad to note that HFMC may be giving up their current arrangement in the next contract year and creating one that looks much more like Exhibit 13b.

Lipid Clinics

The use of lipid clinics for coronary artery disease patients presents a very different picture because in this case much of the cost of the innovation comes in the form of new salaries and expenses. Some increased insurance costs are also experienced in the drug benefit.

As Exhibit 11 shows, the direct costs of running the lipid clinics are approximately $145.00 per patient per year; the incremental costs in the drug benefit for the 60 percent of patients in the Health Alliance Plan are estimated at $125.00 per patient per year. Savings result from avoided complications, which are estimated from the literature at $717.00 per patient per year. The ratio of expense to savings is therefore approximately 1 to 2. The less tangible benefits here are significant in terms of better health and an extended life expectancy. In addition, a program such as this increases the value of health care even more than it reduces cost. In the absence of the clinics, only 53 percent of patients had achieved the desired level of blood lipids, which means that 47 percent were receiving expensive drugs with little long-term benefit. However, in the absence of incurring the additional administrative costs for expansion of the lipid clinic program, the system continues to spend between $5 and $6 million annually to achieve therapeutic goals that are not attained.

Despite the combination of clear benefit with cost savings, HFHS is having great difficulty expanding this throughout its networks. As in all systems, direct costs are watched closely because they are the easiest to control. Even though savings can be expected from the program, these occur in a large pool of insurance costs and are hard to identify and capture for reinvestment in the program. In a period of deficit, it is difficult to argue successfully that significant amounts of money should be spent on new programs that improve patient health but do not increase reimbursement from any payers.

The dilemma then is twofold: (1) the savings to some insurer that result from improved lipid levels will not be fully experienced for 10 years or more, and (2) even current savings are difficult to identify as specific items and therefore are difficult to reinvest.

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#610 *The Business Case for Diabetes Disease Management at Two Managed Care Organizations: A Case Study* (April 2003, Web publication). Nancy Dean Beaulieu, David M. Cutler, Katherine E. Ho, Dennis Horrigan, and George Isham. This case study looks at the business case for a diabetes disease management program at HealthPartners, an HMO in Minneapolis, Minnesota, and Independent Health Association, an HMO in Buffalo, New York. Both disease management programs emphasize patient and physician education, adherence to clinical guidelines, and nurse case management.

#609 *The Business Case for Clinical Pathways and Outcomes Management: A Case Study* (April 2003, Web publication). Artemis March, The Quantum Lens. This case study describes the implementation of an outcomes center and data-based decision-making at Children's Hospital and Health Center of San Diego during the mid-1990s. It examines the business case for the core initiative: the development of a computerized physician order entry system.

Hospital Disclosure Practices: Results of a National Survey (March/April 2003). Rae M. Lamb, David M. Studdert, Richard M. J. Bohmer, Donald M. Berwick, and Troyen A. Brennan. *Health Affairs,* vol. 22, no. 2. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845, www.healthaffairs.org.

The Business Case for Quality: Case Studies and An Analysis (March/April 2003). Sheila Leatherman, Donald Berwick, Debra Iles, Lawrence S. Lewin, Frank Davidoff, Thomas Nolan, and Maureen Bisognano. *Health Affairs,* vol. 22, no. 2. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845, www.healthaffairs.org.

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Improving Quality Through Public Disclosure of Performance Information (July/August 2002). David Lansky. *Health Affairs,* vol. 21, no. 4. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845. Available online at http://www.healthaffairs.org/readeragent.php?ID=/usr/local/apache/sites/healthaffairs.org/htdocs/Library/v21n4/s9.pdf.

Factors Affecting Response Rates to the Consumer Assessment of Health Plans Study Survey (June 2002). Alan M. Zaslavsky, Lawrence B. Zaborski, and Paul D. Cleary. *Medical Care,* vol. 40, no. 6. Copies are available from Paul D. Cleary, Department of Health Care Policy, Harvard Medical School, 180 Longwood Avenue, Boston, Massachusetts 02115, E-mail: cleary@hcp.med.harvard.edu.

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A 58-Year-Old Woman Dissatisfied with Her Care, Two Years Later (March 27, 2002). Anne-Marie Audet and Erin Hartman. *Journal of the American Medical Association,* vol. 287, no. 12. Copies are available from Anne-Marie Audet, M.D., The Commonwealth Fund, 1 East 75th Street, New York, NY 10021-2692, E-mail: ama@cmwf.org.

Delivering Quality Care: Adolescents' Discussion of Health Risks with Their Providers (March 2002). Jonathan D. Klein and Karen M. Wilson. *Journal of Adolescent Health,* vol. 30, no. 3. Copies are available from Jonathan D. Klein, Strong Children's Research Center, Division of Adolescent Medicine, Department of Pediatrics, University of Rochester School of Medicine and Dentistry, 601 Elmwood Avenue, RM 4-6234, Rochester, NY, Tel: 585-275-7660, E-mail: jonathan_klein@urmc.rochester.edu.

#503 *Accessing Physician Information on the Internet* (January 2002). Elliot M. Stone, Jerilyn W. Heinold, Lydia M. Ewing, and Stephen C. Schoenbaum. In this field report, the authors analyzed 40 websites that offer information about physicians. Finding many instances where websites had incomplete, missing, and possibly inaccurate or outdated data, the authors conclude that health

care accrediting organizations, health plans, hospitals, and local and national industry organizations and associations should make efforts to improve the information on the Internet, saying that it is a potential valuable tool for consumers.

#528 *The APHSA Medicaid HEDIS Database Project* (December 2001). Lee Partridge, American Public Human Services Association. This study (available on the Fund's website only) assesses how well managed care plans serve Medicaid beneficiaries, and finds that while these plans often provide good care to young children, their quality scores on most other measures lag behind plans serving the commercially insured.

For-Profit and Not-for-Profit Health Plans Participating in Medicaid (May/June 2001). Bruce E. Landon and Arnold M. Epstein. *Health Affairs,* vol. 20, no. 3. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845, www.healthaffairs.org.

Improving Quality, Minimizing Error: Making It Happen (May/June 2001). Elise C. Becher and Mark R. Chassin. *Health Affairs,* vol. 20, no 3. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845, www.healthaffairs.org.

#456 *A Statistical Analysis of the Impact of Nonprofit Hospital Conversions on Hospitals and Communities, 1985–1996* (May 2001). Jack Hadley, Bradford H. Gray, and Sara R. Collins. In this study, the authors analyze the effects of private, nonprofit hospital conversions that occurred between 1985 and 1993 by comparing converting hospitals to a control group of statistically similar private nonprofit hospitals that were estimated to have a high probability of conversion, but did not convert over the observation period. The report is available online only at www.cmwf.org.

#455 *The For-Profit Conversion of Nonprofit Hospitals in the U.S. Health Care System: Eight Case Studies* (May 2001). Sara R. Collins, Bradford H. Gray, and Jack Hadley. This report examines the 87 for-profit conversions of nonprofit hospitals in the years 1985–1994, more than one-third of which took place in three states, and nearly half of which were in the Southeast. The report is available online only at www.cmwf.org.

Measuring Patients' Expectations and Requests (May 1, 2001). Richard L. Kravitz. *Annals of Internal Medicine,* vol. 134, no. 9, part 2. Copies are available from Richard L. Kravitz, Center for Health Services Research in Primary Care, University of California, Davis, 4150 V Street, PSSB Suite 2500, Sacramento, CA 95817, E-mail: rlkravitz@ucdavis.edu.

Current Issues in Mental Health Policy (Spring 2001). Colleen Barry. *Harvard Health Policy Review,* vol. 2, no. 1. Adapted from an issue brief prepared for the John F. Kennedy School of Government/Commonwealth Fund Bipartisan Congressional Health Policy Conference in January 2001. Available online at http://hcs.harvard.edu/~epihc/currentissue/spring2001/barry.html.

Health Plan Characteristics and Consumers' Assessments of Quality (March/April 2001). Bruce E. Landon et al. *Health Affairs,* vol. 20, no. 2. Copies are available from *Health Affairs,* 7500 Old Georgetown Road, Suite 600, Bethesda, MD 20814-6133, Tel: 301-656-7401 ext. 200, Fax: 301-654-2845, www.healthaffairs.org.

Patient Safety and Medical Errors: A Road Map for State Action (March 2001). Jill Rosenthal and Trish Riley. Copies are available from the National Academy for State Health Policy, 50 Monument

Square, Suite 502, Portland, ME 04101, Tel: 207-874-6524, Fax: 207-874-6527. Available online at www.nashp.org/GNL37.pdf.

#446 *The Quality of American Health Care: Can We Do Better?* (January 2001). Karen Davis. In this essay—a reprint of the president's message from the Fund's *2000 Annual Report*—the author looks at health care quality: how to define it, how to measure it, and how to improve it.

Envisioning the National Health Care Quality Report (2001). Committee on the National Quality Report on Health Care Delivery, Institute of Medicine. Copies are available from the National Academy Press, 2101 Constitution Avenue, NW, Box 285, Washington, DC 20055, Tel: 800-624-6242, E-mail: www.nap.edu.