RECORD, Volume 24, No. 2*

Maui II Spring Meeting
June 22–24, 1998

Session 16PD
Effective Approaches to Disease Management

Track: Health
Key words: Managed Care

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Summary: Disease management has been lauded as the latest generation of effective managed care. Panelists examine this approach and the successes achieved and shortcomings witnessed so far.

Mr. Alan H. Spiro: In a lot of ways my own definition of a good disease management program comes closest to the bottom listed in Insert A, one which is a holistic effort to treat the disease and its accompanying symptoms across the course of the disease including the medical and natural history of the disease and the context in which the disease is occurring. Diseases happen and occur to people who have other lives, who have lives that have social pieces and psychological pieces and economic pieces, and a good disease management program should revolve around all those different components of the person, not of the disease per se. Disease management is a systematic proactive case management model that utilizes an organized approach to provide early intervention along with continuum of care, and that includes active patient self-care participation in the maintenance of their optimum state of health. There's a wonderful book by Oliver Sachs called, *An Anthropologist from Mars*, in which he describes people's lives. They're people who have chronic illnesses and he talks about them as people, how those chronic illnesses are only one aspect of their life. A good case management approach must involve that patient, and the nice thing about it is it becomes a win–win situation because if done right, what happens is people maintain functionality and they

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Note: The charts referred to in the text can be found at the end of the manuscript.

decrease cost as a result because the more people are functional and working, the less cost they're going to generate in the health care system. That's the nice thing about a disease management approach which can become true win–win situations.

INSERT A
IS DISEASE MANAGEMENT:

- A medical management approach to the symptoms of the disease?
- An effort to prevent disease or disease progession?
- A pharmaceutical intervention program for symptom management/reduction?
- A holistic effort to treat the disease and its accompanying symptoms across the course of the disease and within the context in which the disease is occurring?

Historically, disease management is really the next step of the progression of what started with just discharge planning. With old discharge planning, someone was in the hospital and the last day of hospitalization, a discharge planner would come around and talk about what care they needed outside of the hospital. That progressed to where we had the case manager get involved on the hospital side earlier in the hospitalization, involved in planning outside. When the case manager moved into the insurance and managed care arena, it even got involved before the person ever reached the hospital. Disease management in some ways is just a specialized form of case management for patients with selected diseases have proved amenable to this type of approach. By amenable, I mean where they get improved quality of care and decreased costs because those are the two major components that you have in order for disease management to be worthwhile.

When you're looking at disease management and you look at quality and cost, you have to look at the cost of the system. Disease management, when it's done right, presents a way of doing it right and a way of doing it wrong. The cost is that you have to have proper information systems; telecommunication systems are critical here. A lot of the work that's done with patients is telephonic, and there has to be communication with the physician and the other care givers. You need staff obviously, nurses and other support staff, as well as an administrative engine to work around it. There are potential savings though, potential benefits. You can measure decreased Emergency Room use, decreased hospitalization, decreased testing; you can measure a decrease in certain secondary complicating illnesses. What is interesting is that most of the studies that are done show improved compliances with prescribed treatment. That may translate into an increase in pharmaceutical cost, which is why the pharmaceutical companies are so interested in it, but I'll put it as a positive in terms of improved compliance right here.

What are some targets for disease management? It clearly depends on how you define disease management. We'll get into that in a minute. Asthma was one of the early models for successful disease management, although honestly it seems to be most successful when it's done by a Jewish hospital in Denver and less successful when it's done anywhere else. COPD and angina are models, certainly cancer is a model for disease management. Congestive heart failure is one disease where there's been the most experience in terms of true financial data to show decreased cost related to a disease management approach, diabetes is another. For some of the others on this list, you have to define disease management differently and you almost get into what I'll call demand management. When you get into silent diseases, like high blood pressure and high cholesterol, there the amount of intervention that you need is much less, the degree of interaction needed is much less, and through certain demand management programs that are just telephonic advice and educational material and out of the other components, you could often get a good approach to hypertension and high cholesterol for a lower cost.

INSERT B
TARGETS FOR DISEASE MANAGEMENT

Asthma	High Blood Pressure
COPD	High Cholesterol
Angina	HIV/AIDS
Cancer	Renal Failure
CHF	Migraine Headaches
Depression	Osteoporosis
Diabetes	Schizophrenia
Hemophilia	

Certain drug companies have gotten into disease management obviously because of certain interest. I know some people at the Disease Management Institute, which is a not-for-profit institute dedicated to improving care for osteoporosis. It would have to be a not-for-profit subsidiary of Merck, and I'm sure that's nothing to do with the sale of Fosomac, but it is out there as a not for profit and they have a very targeted approach to osteoporosis. In the same vein, some of the other efforts that are on the list were clearly put forth as disease management targets by the drug companies that have pharmaceutical products to treat those. I'm actually not arguing against those or just mentioning it as them being out there. Some of them are very fine programs that you can take advantage of.

What's the methodology? How do you start a disease management program? Well, you have to understand the nature of the disease and the nature of the treatment certainly. You have to look at the individual characteristics in light of the disease. For example, in congestive heart failure, you have a disease that is controllable with

diet and pharmaceutical intervention, but one in which it's hard for the individual to do it; it's a tough lifestyle. It's a lot of medications, it's watching the diet, it's weighing yourself every day, it's hard. There's good data to show that anyone who takes more than two medications a day, compliance goes way down, and that's normal. You're living your life in a normal way, you don't want to think about taking medication, especially multiple times during the day. You have to understand what the disease is like, how quickly it can change, and those characteristics. You have to understand the environment; is it a disease in which people are going to be mainly young people? Is it mainly elderly people? What kind of lifestyle? How does it impact lifestyle? Will it impact on a person's ability to drive which means not only their ability to get to the grocery store, but also to get to a doctor? All this has to be understood. You have to understand the interventions and also the interventions that have an impact on care that are sometimes not thought of as interventions, such as, weighing yourself every day. That's an intervention actually, getting someone to weigh themselves every day for congestive failure. It is one of those little things which can make the difference between an emergency room visit or a hospitalization or just maintaining someone in a chronic way.

One of the keys to disease management is that we're dealing for the most part with diseases that do not have cures. I listened to Dr. Lundberg with great interest because we talked about outcomes. Well, what's an outcome? I have trouble with this because in many ways, the medical model is used to thinking of an outcome as either cure or death, there seems to be very little in between. The real fact of the matter is what you usually have is chronic maintenance of a chronic illness that people live with. So when you define that outcome and you define the context, you have to define those factors in the environment, in the treatment that may put someone out of the balance that they maintain in managing their life with their chronic illness.

Disease management certainly should include multi-level education, "multi-level" meaning patient, physician, care giver, family. It should involve protocol use, development, and guideline. With regard to compliance monitoring, a guideline isn't very good unless you can measure against it and determine if someone is doing it. On the physician side, compliance in terms of the patient, it doesn't help much to prescribe a medication that someone doesn't take. I sound simplistic, but it's probably the number one reason that congestive heart failure patients end up in emergency rooms.

It must include expert care, and expert care sometimes has to be balanced with the choice of care because people often choose care that is less than expert. They

choose care for a variety of reasons, and the expertise of the care giver is only one and it's often not the main reason. So there has to be steerage involved in many disease management programs to get people to the expert care. And most importantly, it includes expert coordination. It's hard to manage all these different factors and also manage your life. The good disease management programs tend to give that kind of support to coordinate all these different factors.

A good disease management program should know very well the resources needed for the patient, and supply them. For most managed care organizations, insurance companies, anyone involved in disease management, disease management vendors, that means they must have at their disposal contracted facilities, providers, physicians, other type of providers, good home care resources that know about disease management, community resources as well as the resources that are out there for free from the voluntary health organizations which can be quite good, voluntary health organizations may have support groups. There's a lot to tie into and that disease management program has to coordinate all these resources, as well as coordinate all the pieces from the patient point of view.

A good disease management program should also be seen as a support for physicians, not as the enemy although that sometimes happens. By physician support we mean, patient education materials that are sent through the physician. A physician sees that as a positive, getting article reprints, care guidelines. The access to disease managers where the physician has a comfort level and staff support is very important. The information systems and telecommunication systems needed to coordinate all this are formidable. Patient education usually involves a 24-hour nurse hot line, newsletters, patient guides, self-help booklets, videos, and Web pages, as well as the materials by physicians mentioned earlier. Naturally, all of this from a financial point of view, is expensive and in order for a disease management program to be worthwhile financially, you've got to take all these operational costs and balance them against those potential savings.

You must have expert clinical protocols. Usually, they involve the panel process from the generalist, as well as from the specialists. It must be based on academic literature, and you have to have input from all data sources. Now in many ways, I'm making an argument here that goes totally against what the earlier speaker said, which was expert clinical protocols developed in the panel process was on the bottom of the hierarchy. I guess I'm just a realist. The controlled, double-blinded outcome studies just aren't there, and the problem in their getting there is they take time and the fact is that medical information, new treatments, new ways of doing things, change rapidly enough that a real problem is that by the time you're done with an outcome study, what you are studying is no longer the norm of treatment.

It's a real dilemma, and I'm being very serious. You have tremendous problems in basing this on outcome studies. You are usually left with having no choice but to develop and to depend on an expert panel process.

Clinical data is a critical piece, but it's very hard to get at. Most, even the new electronic medical records, are text-based. When you have something in a text file base, you can't break it down and analyze it, you can't aggregate data elements, which is what you really need to do. We're getting to that, but it's difficult. Surveys and quality of life indicators are of critical importance in all this because you have to know from the patient how they're feeling. Sir William Osler, who was considered the father in many ways of modern internal medicine, was quoted as saying that you should always listen to the patient, they're telling you what's wrong. Well, if we can do it in a more sophisticated way through surveys, that's great. That also ties into the quality measures. Obviously, the medical literature and the regulatory issues have to be taken into account as well. What do I mean by that? Well, if a regulation says that you must keep a woman in the hospital for at least two days after childbirth, the fact that an expert clinical panel says that one day is fine, it doesn't matter, the law says two days and you have to go by the law.

The disease management programs tend to coordinate around people called disease managers who are usually nurses, but need not be. Social workers, other types of backgrounds can function very, very well in that role. They have to take into account the psychological needs, social needs, medical needs, the clinical protocols, the resources, contracts, information, everything has to be taken into account. The job is an important one and it gets into a whole issue of what I'll call telephonic medicine. Most of this is done over the telephone with a nurse sitting before a computer console in which this information in a real-time basis is available. In good disease management programs, when a patient calls in, that nurse will be able to bring up that patient data on a screen right away as they're talking. If you don't have on information system backbone that is tied into the telecommunications system, you are really going to have a hard time putting together an effective disease management program. Again, there's a large capital cost involved in this, as well as ongoing cost just with the maintenance of the systems.

Quality, often hard to define, care rendered at the most advanced level in terms of personnel, equipment, and setting, it's often difficult not just for geographic, but even because of patient choice, reasons. You can get into some very difficult social interactions with a patient who really believes that their general practitioner, or family practitioner, is doing the right thing. However, a disease management program may say they're not. I give you a quick story from my GI background, I

was involved in doing a data analyst and a pharmaceutical claims database having to do with the treatment of ulcer disease. Now the science is that ulcer disease in today's world is an infectious disease caused by a bug treated by antibiotics. If you look at a pharmacy database, and I did this less than a year ago, on that database you will find that physicians treat ulcer disease as an acid mediated disease that you treat by decreasing acid. Well, we've got a disjoint here. If you're in a disease management program, you may get at that by trying to educate the physician or you may try to get them to another setting. Either way, you often have a tough sell.

A lot of health care systems don't have a tremendous amount of service involved and that can be a problem. Seamless communication between professionals, patients and payers relates back to the information system needs and easy access to care. Part of a disease management program can tie in and should tie in to a continuous quality improvement cycle in which, from the disease management program, you're aggregating more clinical information, you're getting more information on an ongoing basis, feeding it back to your expert panels, updating your clinical criteria, updating your guidelines, and continuously getting a better system. The fact is that medicine is changing all the time, the fact is that the guidelines are almost by definition outdated the minute you write them, but that's okay as long as there's a process in place to continually improve them. A good disease management program should actually offer that process.

What questions should you ask if you are starting a disease management program? For many organizations that are getting into this, they first have to decide what their goals are. Are they financial goals? Are they quality of care goals? Are they a combination of both? Are they patient satisfaction or member satisfaction goals? I've been with plans that had some great programs in place that have tried tremendously to keep them quiet because they were so afraid of the adverse selection inherent in advertising a good disease management program and that's a real issue, but you have to decide on your goals. To start it, you need to have someone to spearhead the effort, and it is very time-intensive to build these operational systems. This is not an easy thing to do. Because of that, every organization has to ask, What is their capacity for starting disease management?

We're going to hear a little bit about vendor selection, I know a lot of organizations start out wanting to get into disease management on their own, do it themselves. We have good doctors, we have the experts, we don't need an outside company. They soon find that they don't have the capacity they needed to really do it on their own, and that they have to farm it out, go with vendors. You have to have a marketing plan, and the marketing plan is sometimes complicated by issues such as not wanting to advertise too much because of adverse selection. You must have the

information systems and the telecommunications to support it. Without that, you are really going to have a very hard time doing much of anything. Obviously, the bottom question is then, should we contract for all or some of these elements? It's a critical question with many organizations choosing to go to a vendor rather than have to take all this on on their own.

For a patient with a chronic illness, the coordination of every day life is extremely challenging. When you also need to not only coordinate your life which means your family relations, your work, everything else, but you have to coordinate all the care you receive. We're asking a tremendous amount from patients with chronic illnesses, and disease management has the opportunity to change that. It's amazing to me a few years back because in my previous life, I used to deal with inflammatory valve disease. The Voluntary Health Association especially with inflammatory valve disease put out a booklet titled, *People, Not Patients*. I thought that was a wonderful title because for these people with these chronic illnesses, very often the insurance or managed care system forces them into a situation where they have to provide a tremendous number of coordinating activities that are extremely difficult because of the different elements and desperate elements of care. Disease management when it's done right has the ability to change that into a very positive effect. Also a secondary phenomenon that occurs is that because of that effect, it can save dollars. And with that, I will turn the floor over to Tony to talk about dollars.

Mr. Antony Gallagher Friel: I'm going to cover a case study in diabetes. What I'm going to do is go through a cost benefit analysis of how we would value a disease management program. First, I'm going to talk about why diabetes is a good target for disease management, cover some of the factors that need to be addressed when developing a model that evaluates the cost and the benefits of a disease management program, and then last, I'm going to go through a numerical example that illustrates some of the methodologies that we used to evaluate these management programs. It's complete with some contingencies mathematics so it's definitely geared toward this audience, not toward physicians. We'd be spending twenty minutes a slide if we had to explain all the numbers.

In any case, diabetes is a significant health care problem in the U.S. Approximately 15.7 million people or 6% of the population have diabetes. It varies with age. The incidents of diabetes increases as you get older, it also varies by race, and then the incidents are also increasing in the U.S., that's mostly due to the fact that we do have an aging population.

The costs are significant. The direct medical costs of diabetes in 1994 was approximately $106 billion. The indirect costs were a little bit more than that such as disability income, lost production cost, and also the cost due to premature death. The total health care dollars in general is a lot higher for diabetics and non-diabetics. Specifically, almost 15% of the total health care dollar is due to diabetics, while only 6% of the population has diabetes. And comparing a diabetic's annual medical cost to a non-diabetic, there's a factor of about 3.6 times. Of that $106 billion spent on diabetics, much of the cost is actually due to the cost associated with these other complications.

Chart 1 really shows you that diabetes is a prime target for disease management. There's about two times the likelihood of a diabetic experiencing heart disease and stroke than a non–diabetic. Approximately half of new blindness and end stage renal disease are due directly to diabetics. Genetics is the biggest risk-factor, race is another one. Hispanics and African–Americans are about twice as likely to have diabetes, and an real interesting program that we work with the highest target is the native American. In some Indian tribes, the incident of diabetes can be between 30% and 50%. Age, as I alluded to earlier is a big factor in becoming diabetic, as are obesity and exercise. If you exercise you lower your chances of developing diabetes.

Factors to consider when you're developing a model are age and sex mix. There are a lot of other mathematical calculations like calculating average decrements more so than specific decrements for individuals, demographic mix, geographic location. Many of the savings are illustrated in the percentage of medical cost and percentage of loss production, which in turn is estimated using salary. So, for example, in the northeast, both your medical costs and your salaries are higher so you might read higher savings up there versus say in the southeast. In blue collars areas their diet is a lot worse, there's a lot more alcohol abuse, a lot of the cost associated with disease management programs are fixed. Also, obviously, if you have a larger population, the more people you have cover with those fixed costs.

Start up costs include information systems. There are protocol development and clinical development, and educational material not only to publicize in your program, but also to ensure people get the right education with respect to diet, etc. Ongoing costs include: salaries and information systems. Performance, monitoring a data collection, that's particularly difficult in disease management because many times, the savings that you reap out of your disease management program won't be realized for three and four years down the line. You need to track the data to that particular patient through a longer period of time than just six months to a year.

Quality measurement, and incremental pharmacy cost are sometimes higher than you would have without a disease management program.

One of the main goals of a disease management program is to make sure a patient is getting the care that he or she needs in an appropriate setting. Hope we cut down on emergency room utilization, also educate the members on what is an appropriate self-referral. You don't want diabetics going to endocrinology every time their blood sugar increases, for example. Loss production costs is very important and if the person does not work, you're also going to have to pay disability income. Wellness programs, measuring the outcomes of a specific diet, and emotional well-being are very interesting. If I go back to the Indian tribe examples, one of our clients is an Indian tribe that owns their own casino. Their costs are not important to them, their biggest concern is that their health care program is making the members of their tribe happy, and that would be their main goal if you allude to the goals of your disease management program. Another example is diabetic children; some just refuse to have diabetes and in turn, they do not take their insulin or adhere to diets. That leads to medical complications. So emotional well-being is a very important part of an effective disease management program.

Now let's discuss some actuarial terms. Things that need to be considered are employer and health maintenance organization (HMO) turn over. The HMO turnover is high, and that's important because many of times you don't see savings until several years later. So that particular person with diabetes still needs to be in that HMO population four years down the road for the HMO to really reap the benefits of such a program. Mortality and recividism are other decrements. For example, you might have a specific diet for a diabetic and you might be able to measure the impact of that diet, but four years down the road if that diet is not being followed, that's going to affect your cost model.

A major factor that influences financial results is saving assumptions. The incidents of disease is obviously very important, your decrements, also your medical cost and your salary assumptions. Table 1 is a simple numerical analysis.

TABLE 1
COST/BENEFIT ANALYSIS—ABC COMPANY ASSUMPTIONS

Number of members	15,000
Average Age	45
Average Salary	40,000
Average medical costs of non-diabetics	$125
Incidence of Diabetes	6%
Number of Diabetics	900

In this example, there's a population of 15,000, the incident of diabetes is 6%. That comes out to 900. Just comparing medical costs, per member per month medical costs for 900 diabetics in this example is $125. And if you apply that factor of 3.6, the average medical cost for a diabetic is $450 per member per month. Just looking at the population as a whole, that 6% of the population that is diabetic make up almost 20% of the medical cost in this particular example.
Table 2 is a measure of loss production, $40,000 is the average salary, loss production of your average employee is 4% of the salary, which is a little bit less than two weeks. Loss production cost per diabetic equates to $1,600 per year. If you apply that to the 900 diabetics, that comes up to a total annual cost of loss production of close to $1.4 million.

TABLE 2
COST/BENEFIT ANALYSIS—LOST PRODUCTION COSTS FOR DIABETICS

Average Salary	$40,000
Lost Production Cost (%)	4%
Cost per Diabetic	$1,600
Total Annual Cost	$1,440,000

Table 3 shows the cost of the program. Your initial investment, which would include the information systems, some of your educational material, $225,000, and then the ongoing cost years one through five is assumed to be $160,000.

Savings as a percent of total medical cost illustrates the fact that if you do disease management, you can save up to 12% if an individual does stay in your population through year five. Again, this is a fairly conservative assumption. Loss production is the same methodology. Over time, a sick person is out of work and a healthy person is back to work, so you can reap some savings over loss production costs.

TABLE 3
COST/BENEFIT ANALYSIS—CASH FLOW

	Costs	**Savings**	**Cash Flow**
Initial Investment	($225,000)	$0	($225,000)
Year 1	($160,000)	$128,561	($31,439)
Year 2	($160,000)	$226,244	$66,244
Year 3	($160,000)	$293,915	$133,915
Year 4	($160,000)	$332,440	$172,440
Year 5	($160,000)	$342,684	$182,684
Internal Rate of Return			23.7%

Table 4 illustrates annual savings for a diabetic. If you apply those percentages to the total annual costs of a diabetic, in year one, that would equate to $130 and that increases to $648 in year five. Loss production is $31 in the first year of savings increasing to $154. So in year five, you possibly could save $802 per diabetic combining loss production savings and also medical savings. Decrements again, have to be in your program still for an HMO and an employer group to see the savings. I made some assumptions on employee turnover. For an average employee, the probability of staying through year five is 50%. You can combine that with some mortality assumptions, and you come up with the probability of you being in that particular population of 47½% throughout the five year projection period.

TABLE 4
COST/BENEFIT ANALYSIS—SAVINGS PER DIABETIC

	Medical	Lost Production	Total
Year 1	$130	$31	$160
Year 2	$259	$61	$321
Year 3	$389	$92	$481
Year 4	$518	$123	$641
Year 5	$648	$154	$802

From the Floor: Is that all people?

Mr. Freold: That's all people combined.

For audiences that want to take a disease management approach, I present their program to a chief financial officer of a HMO. This analysis is useful because (1) they can present their clinical expertise, but (2) show the fact that there is an internal rate of return associated with the disease management program so "here's what we did."

Table 5 compares the cost of the savings and in this particular example, your internal rate of return over the five year period was about almost 24% for your initial investment and your ongoing costs.

With the disease management program, you're not going to see your return for a number of years to come. In our example here, it's five years but in the long run, you have diabetics coming in and diabetics going out, and overall hopefully your savings increase year in and eventually, hopefully, your savings will exceed your cost in your projection period.

TABLE 5
COST/BENEFIT ANALYSIS—CASH FLOW PMPM

	Costs	Savings	Cash Flow
Initial Investment	($1.25)	$0	($1.25)
Year 1	($0.89)	$0.71	($0.17)
Year 2	($0.89)	$1.26	$0.37
Year 3	($0.89)	$1.63	$0.74
Year 4	($0.89)	$1.85	$0.96
Year 5	($0.89)	$1.90	$1.01
Internal Rate of Return			23.7%

Lastly, we actuaries always like to analyze data. Some of the data we need to look at for a disease management program, pharmacy utilization hospital data, length of stay data, diagnostic related group data, emergency room utilization, and procedure and diagnostic codes. We look at current procedural terminology for the physician component. We also look at ICD-9s, International Classification of Diseases-9th Revision and UB-92 for utilization. We always look at charges compared to reimbursement, and also costs and inpatient surveys are important to disease management with respect to quality outcomes. On that note, I'm going to turn it over to our good friend, Joe Korabik.

Mr. Joseph G. Korabik: I'm with the Blue Cross and Blue Shield Association. As Martin indicated in his introduction, I've recently been involved in selecting a disease management vendor for a large national account, namely the Federal Employee Program. Today I'm going to give a presentation on some of the issues and concerns we dealt with in selecting a vendor and more specifically, in dealing with some of the financial arrangements that we were looking for.

Before I start, just a little brief introduction on the Federal Employee Program. FEP it's a rather complicated animal. The Association, through its member Plans, offers to federal employees and annuitants a national Preferred Provider Organization (PPO) plan as part of the larger Federal Employees' Health Benefit Program (FEHBP). The claim processing and provider contracting is done at the local Plan level with the exception of drug plans which are administered by two nationwide, Policy Premium Method (PPMs) and the contract administered by the Association staff in D.C. with significant actuarial support from a group of actuaries in Chicago of which I'm one. The FEHBP members go through an annual open season around mid-November to mid-December at which point they select from a variety of Plans. There are 14 or 15 national Plans and depending on where they live, there could be anywhere from zero to 25 HMOs from which they can select. We actually compete against some Blue HMOs in some areas so it's kind of an interesting

situation there. And the Federal Employees Health Benefits Program as often been called a model for national health care reform.

The population is a significant consideration in selecting and implementing a disease management program. About 30% of our members use our Plan as a Medicare supplement. We decided not to include them in the program since we would basically see a net loss on anything that we paid out for the coverage.

The population is pretty aware of the benefit cost and are extremely price sensitive so any claim cost increases that result in a premium increase may cause an exodus from our Plan to other plans. Lately, we've been pretty successful though, around 40–45% of the federal employee population is in our Plan. The most important thing with respect to a disease management program is that it is very sensitive to the confidentiality of claims data. People will not hesitate at all to call their Congressman which may ultimately lead to a General Accounting Office investigation which we are very keen on avoiding.

FEP disease management history, used to be limited to local Plan programs that the Plan started for their HMO Plans. Case managers would refer FEP members on an as-needed basis. We've never really tracked any outcomes associated with that so we don't know if they were successful or not. A couple of years ago, we entered into a pilot agreement for six of our Plans to do an asthma disease management program and a GI program. The enrollment process was very low impact, just strictly direct mail, no direct contact of either the patient or the physician. Even with such low impact, we got around 20%, and that seems to be pretty good. A research group has indicated that's not too bad for a low impact enrollment process, which might indicate that our clientele is interested in getting into a disease management program on their own. As far as the results of those programs, we haven't completely evaluated the effect of it yet. Probably with the GI impact, initial indications are that it was not very successful for a variety of reasons. A lot of the GI drugs were moving from brand to generic status, the treatment of H-Pilori became a somewhat more acceptable standard, although not to the extent that it should be. Also, a lot of the ulcer drugs that used to be prescribed to maintain and treat the acid are starting to be prescribed on an as-needed basis for patients to take when they want to relieve the symptoms associated with some of the condition.

Based on our previous experience, as well as discussions with consultants–from the disease management consortium–we determined what we were looking for in a disease management program. We wanted to maintain the voluntary participation due to the PPO nature of our Plan, lack of a gatekeeper. There's some indication that if it's a voluntary participation, the patients are more likely to really want to

affect a lifestyle change rather than feel that they're forced into doing something. So hopefully that was beneficial in the long run. The vendors we were dealing with had little PPO experience. Their experience was mostly with Medicare risk plans and HMOs. And also with respect to the government people that we're covering and our desire not to upset them, we decided to hold off the enrollment process until a focus group research indicated what would be the most effective way to maximize the enrollment in the program. Again, we were going on a pilot basis with the potential to go nationwide somewhere down the road, offered to Plans that either were dissatisfied with their own programs or to those that had no programs in place. A key was a seamless interface with our demand management service. We saw this as a window for patients to access the disease management program. Again, we were just going to cover the non-Medicare patient population at the outset.

Financially, our goals were more to maximize the impact rather than minimize the fees. We were more willing to spend $1,000 if we could see $2,000 in claims reduction to go with an easy $100 cost for a $200 claims reduction. The return on investment is identical, but the bottom line impact is obviously much greater. To that end, we were not very comfortable in spending $1,000 only to see $500 in claims reduction resulting in that cost. So in contracting arrangements we sought to minimize our financial risk. Some of the things we expected to see, Tony and Alan addressed earlier, were reduction in input/output and emergency room visits. As far as increasing prescription costs with the diseases we selected, congestive heart failure and diabetes, we expect a pretty immediate increase in the drug costs as the programs seek to improve compliance with the drug regimens prescribed. However, it's conceivable that if there's a lifestyle change, the need for prescriptions might actually go down if the patients are able to change their lifestyles sufficiently. As far as the office visit cost, I think we expect to see an increase in the frequency, although that is likely to be offset by a decrease in the intensity of any services associated with office visits. Home health care claims, depending on the nature of the vendors' interventions, are likely to increase. One of the things we required was that the vendors include the home health care costs in their fee structure.

We identified congestive heart failure and diabetes as the diseases to intervene upon for a couple of reasons, not the least of which was that they were among the ten highest costs for Federal Employees Program. Secondly, they were most likely among the diseases that Doctor Spiro addressed, more likely to see a direct and relatively immediate impact from interventions on these two diseases unlike, for example, hypertension which would be much longer term and might not require as significant interventions. Once we defined the diseases to treat, we went about

attempting to identify the patients. We restricted what we captured in our database to just using the ICD-9 codes and the prescription drug data. Some of the drugs that might be used for congestive heart failure would be Lanoxin, some of the ace inhibitors, etc., and of course for diabetes, you'd look for insulin as well as gucophase. Other information that would be very useful in identifying the patients would be diagnosis related groups, ambulatory care groups, or something called episode treatment groups, which we don't yet have access to but within the next year or so, we expect to. That should go a long way toward identifying the patients, however, a significant part of the vendor selection process has to do with stratifying by severity. This information would be of limited use, and actually stratifying the patient base by severity. Naturally, you would expect a person with high claims cost, to more likely be a higher risk patient. However, there's a chance that even low utilizers are high risk based on some descriptive clinical data, for example, blood pressure readings or blood sugar readings that we had no access to due to the nature of our program as a Preferred Provider Group.

I want to say that the geography was significant in that it would impact how easily or with what difficulty the vendor might actually be able to get to the patient. We have both rural and urban customers in our Plan, and that's a significant issue with the vendors as to whether they can get to them or not. Diagnosis codes are not only useful in identifying the disease, but also in identifying which morbidities are present, which might reduce or negatively impact the interventions.

Tables 6 and 7 are the claim summary of the patients we identified as congestive heart failure and diabetes. This is essentially what we provided to our vendors for them to offer a bid upon. It turned out to be significantly insufficient. My advice would be send them as much data as possible if you want a reliable estimate.

TABLE 6
DISEASE MANAGEMENT VENDOR SELECTION ISSUES
CLAIMS SUMMARY FOR CHP PATIENTS (1996)

	Percentage Total non-Meds	**CHF Claims as Percentage of Total***	**Patient Cost vs. FEP Adults**
All CHF Patients	1.5%	12.8%	7x
Patients with CHF Admit	0.2	36.9	15x
Top 20% CHF Patients	0.3	13.4	25x

*CHF claims exclude drug claims

TABLE 7
DISEASE MANAGEMENT VENDOR SELECTION ISSUES
CLAIMS SUMMARY FOR DIABETICS (1996)

	Percentage Total non-Meds	**Diabetes as % Total Claims**	**Patient Cost vs. FEP Adults**
All Diabetes Patients	4.5%	12.3%	2x
Patients with Diabetes Admit	0.2	43.1	9x
Top 20% Diabetics	0.9	12.7	8x

*Diabetes claims exclude drug claims

At this point, we're ready to solicit the responses to a proposal. Some of the considerations were as to the financial arrangement we were seeking, whether to seek a guaranteed savings or fee-for-service arrangement. If we did go with a guaranteed savings arrangement, do we allow the vendor to share in the saving? What claims would we include in the savings estimate? Were those for all eligible patients or only those that enrolled? Those claims for all the diseases that they have, or only those specific to the disease being managed? Also, of course, length of the base line periods and program periods, as well as a run out period, and what was our preferred fee structure? Do we want to go by per enrollee or per eligible member?

These next four inserts C–F summarize some of the shared saving proposals which we received, none of which we found satisfactory for a variety of reasons. With vendor A, on Insert C they were going to charge us the per month per member (PMPM) for all non-Medicare members even those without the disease. What they were planning on doing was taking all our membership. Then they would determine who has congestive heart failure and who had diabetes rather than allow us to have an input in it. We're not comfortable with that. Also there was a shared savings issue which we started to get very wary of. Vendor B on Insert D, was a little closer to what we were looking for. We wouldn't pay anything if savings fell to meet the threshold of X percent, say if it was 10% on $10,000. Of course, if the savings plus the fees was less than $10,000, then we would get a full refund of the fees that we had already paid. Again, there was a shared savings issue where all the savings beyond the threshold would accrue to the vendor, we were not at all comfortable with that. The last line, the base line claims, held constant for three years. The problem with that is if you hit the savings in the first year, then anything additional in the subsequent years, you wind up paying not only the program fees but also any savings beyond the threshold point since you already hit the threshold point. With Vendor C on Insert E, we ultimately discharged them pretty quickly, mostly because it did not offer a guarantee and we were looking for a guarantee.

Additionally they were not able to meet our nationwide requirements. Vendor D on Insert F was rather complicated. Again we had the shared savings, 100% beyond the target would accrue to the vendor, and they were only limiting the guarantee to the higher risked patients. We were again not comfortable with that.

INSERT C
DISEASE MANAGEMENT VENDOR SELECTION ISSUES
EXAMPLES OF SHARED SAVINGS PROPOSALS

Vendor A

- PMPM for all non-medicare members in pilot Plans, not just identified patients
- FEP's liability defined as follows (savings = S):
  - If S < $X, then fees = S
  - If S > $X, then fees = X+y% (S – X)
  - y could be constant or graded
- Monthly payment of program fees

INSERT D
EXAMPLES OF SHARED SAVINGS PROPOSALS

Vendor B

- Savings (S) equal the excess of I over II:
  - (I) Program claims and vendor fees
  - (II) Claims in baseline year
- If S < x% baseline claims, FEP gets full refund
- Any savings beyond x% accrue to the vendor
- Monthly progress payment (per enrollee)
- Calculation includes all eligible patient claims
- Baseline claims held constant for 3 years

INSERT E
EXAMPLES OF SHARED SAVINGS PROPOSALS

Vendor C

- No guarantee offered
- Offered shared risk:
  - Split fees 50/50
  - Split savings 50/50

INSERT F
EXAMPLES OF SHARED SAVINGS PROPOSALS

Vendor D

- Stratified savings by patient's annual claims
  - $30k target savings=30%
  - $24k–30k target=25%
  - $18-24k target=20%
  - $12-18k target=15%
  - $12k or less target=0%
- 100% savings beyond target accrue to vendor
- Guarantee only for Level III and IV patients

We were uncomfortable with four of the five proposals we received. The one we were comfortable with limited our liability to the maximum of the savings and the program fees, and that's I think we settled in on that being what we were seeking. Also by this time, we had not yet done clinical on-site reviews of the programs so we felt we still had time to go out with another request for proposal, and specifically outlining what we were looking for. We wanted the vendors to comply with the intentions that I had listed earlier. We wanted some demonstrated outcomes, I guess we weren't holding them to anything really significant, but just something to show that they do reduce inpatient costs and emergency room visits, etc., whether for the disease alone or overall. We needed the ability to handle FEP both on the nationwide basis, as well as the rural versus urban issues. We wanted a guaranteed savings and we settled on no shared savings at all. And finally, we wanted a plan that was going to be responsible for the whole patient, not just the disease, something that would effect a lifestyle change in the patients that they manage rather than just addressing the emergency room visits associated with diabetes.

INSERT G
DESIRABLE VENDOR CHARACTERISTICS

- Comply with FEP intentions
- Demonstrated outcomes
- Ability to handle FEP
- Willing to guarantee savings
- No shared savings
- Responsible for whole patient, not just the disease

To facilitate the comparison of the vendor proposals, there were three things we needed to do. I wanted to facilitate the apples to apples comparison, basically outlining specifically what we were looking for in these proposals. As far as how much data to provide, although I still didn't give them everything we had, I think we gave them a lot more like maybe a distribution of claims cost by a thousand dollars. Then specifically to find the preferred arrangement. Basically, it revolved around limiting our liability to the minimum of the program fees and the savings incurred. As far as evaluating the proposals, it was a short time frame so there were two ways I thought I would be able to do it: (1) either look at the break-even medical cost reduction on a per patient basis or (2) have an expected reduction in claims costs, and that would have required a lot of assumptions and scenarios in a time frame we were just not prepared to do. I think the break-even analysis gave a good indication of what the vendors needed to do to make it worth our while, and whether we thought that they would be able to achieve that savings or medical cost reductions.

Of the major risks they needed to look at in developing our preferred arrangement, number one was we wanted to avoid upsetting the customers. That would be done through the focus group research and the customized enrollment process. Secondly, we wanted to avoid the situation where the program actually increased the costs. We tried to do that through limiting our liability to the minimum of the costs and saving. We wanted to avoid the situation where the vendor cherry picks the easy gainers. We wanted the vendor to actually try to enroll as many people as possible so that we can improve as many people's lives as possible, and we wanted to do that by including all claims for both the eligibles that didn't enroll and the enrollees. Next, we wanted to offset any potential increases in co–morbid utilization where the vendor just focused on reducing diabetes costs without any attention to other costs that might have been associated with the diabetes. We wanted to remove catastrophic claims from the base line use so that the vendor does not get credit for reducing claim costs where maybe the claim in the base line year was due to some traumatic situation like a car accident or some other accident that they had no affect on with their intervention. I wanted to prevent the vendors from taking credit for cost reductions not related to their interventions. For example, if our plans were successful in improving the provider reimbursement that they were paying out, we didn't want the vendors to take credit for that. And finally, we were trying, and are still trying, to come up with a way to prevent inappropriate severity classifications. The thing here is the high risk versus the low risk, it's like a four to one to five to one price difference with respect to what we would have to pay out in fees, and we wanted to avoid a situation where we're paying the high risk fee for too long. We haven't quite come up with a way to do that yet.

So this summarizes the preferred financial arrangement. We wanted to include all claims for the eligibles, not just those that enrolled. We are going to exclude certain conditions such as transplants, cancer cases, the SRD are going to be excluded from congestive heart failure but not from diabetes since that's an ultimate complication of diabetes, and if there was anything beyond $250,000 after we excluded all those other conditions, then we would take that out too, from both the base line and the program cost. The fees we wanted based on actual enrollees so there's a little disjoint there. We only wanted to pay for the actual enrollees, but we wanted the vendor to be at risk for all the patients. Most of the vendors agreed to that. Our ultimate vendor was very unwilling to agree to that so we came up with another solution. Some of the assumptions that we needed to make in evaluating the proposals was stratifying the patients by severity both with respect to enrollment success as well as the effect of the intervention on the utilization. You need to stratify the average claims per cost per patient. I think the ultimate assumption that we made was due to the limited nature of our data. Thirty percent of the highest

cost congestive heart failure users we would assume were high risk, and 20% of the diabetes users we assumed were high risk. I think that's a pretty fair assumption to go on.

Another issue was, how soon after enrollment do interventions begin? We were originally thinking of having a little lag between the enrollment period and intervention period so that the program period for everybody would be identical, for instance the program period would be like the calendar year 1999. Ultimately, we decided to begin the interventions immediately after enrollment, and do the savings on a basis adjusting to some common midpoint later on. The final point was, when can we expect to see savings? With these two programs, there is a little variation. Congestive heart failure you can expect to see savings pretty rapidly. With diabetes, you might not even see any savings until year two or even later.

Our ultimate arrangement then was liability as we wanted, limited to the program costs and the savings, the minimum of the two. So any savings beyond the program costs accrue completely to us. Incidents are a two-year contract which begins October 1, and includes a five-month evaluation period and a 12-month intervention. We are also extending it a couple of months into the next year so that we can allow those people that chose our Plan which might have these conditions to get into these programs and will save some money. The savings calculation will compare the twelve months before the enrollment and twelve months after enrollment for any change in utilization. Also, the way that the vendor offered to offset our concerns with respect to the cherry picking issue was to put in some low enrollment penalty. If they enrolled too few or less people than what they were projecting, their fees would be reduced by a small percentage. The percentage is not significant, but it's enough to alleviate our concerns.

The definition of savings then became the excess of program claims and fees over the base line claims. We're going to adjust both the base line and the program cost to a given midpoint. We want to exclude claims associated with conditions that clearly are not impacted by the program, not just the cancers and transplants that I mentioned before, but such issues as multiple sclerosis where the interventions would have no impact, but the costs are very high.

Some of the outstanding issues would be the treatment of people that drop out of the program as well as deaths, that is, whether to include them in the savings calculation or not. How do we handle the movement of high risk to low risk, how do we regulate that? How do we make sure the adjustments to the claims offset the account for any reductions or increase in claim cost that had nothing to do with the vendors in the interventions? As I mentioned, we're going to have a third party

doing the evaluation. All three of us will make recommendations, and both we and the vendor are going to come to an agreement on how to handle it.

Mr. Martin F. Gibson: Now we'll open up the floor to questions for the panel.

From the Floor: Tony, in your cost benefit analysis, you showed that the savings per diabetic was $160 the first year, $320 the second year, $480 the third year, etc. Could you explain to me why the savings per diabetic each year increased arithmetically, and do you expect there to be an end to the increase in savings year after year?

Mr. Friel: Arithmetically, I took a percentage of it. There's no reason why it would increase arithmetically versus any other.

From the Floor: Why percentage wise?

Mr. Friel: Percentage increase is more for heart disease. As you stick to a specific diet, for example, your complications of heart disease show best example of decrease over time.

From the Floor: So for the diabetic, the more intervention you have each year, the more days that person will not lose in work and production.

Dr. Spiro: With diabetics, there's short-term cost and there's long-term cost. In the short term, you're going to have increased physician visits, emergency room visits if your patient cannot control the diabetes. Long term, the secondary effects of diabetes includes blindness, heart disease, kidney disease which can be avoided if you have better control. So the increased savings in later years comes from those secondary effects which are more long term, the savings in early years just comes from decreased emergency room visits, hospitalizations from just poor control of the diabetes.

Mr. William R. Lane: Alan, I was speaking with a cardiologist a couple of weeks ago. He's been involved in a congestive heart failure disease management program for about two years. His comment to me was that he felt that he was seeing a very significant increased use of hospice programs by his patient which he was attributing to an increased interaction between the patient and the health care providers, both he and nurses. That gives the patient a better comfort level with alternative forms, a better recognition that mortality was certain, but also a trust in the health care system and, therefore, reduced cost because they didn't have the

hospitalizations. I was wondering if you've seen that kind of same increase in the hospice use in other programs.

Dr. Spiro: Well, clearly there's been a number of programs, not just in cardiology, that have seen increased hospice use. Franklin Health which is a case management vendor that deals mainly in end of life issues has a lot of data to show tremendously increased hospice use once you get this kind of either case management, disease management program involved just because of the patient interaction. It's often said that the central myth of American culture is that death is optional, and if you can get patients past that point of believing that, then you can get more appropriate end of life therapy.

From the Floor: I recognize in this setting the numbers you gave us are kind of generic. I'd be very interested in any one member of the panel describing an actual day to day scene, something that's statistically significant, of what the range of savings might be, and how that might vary by type of disease management program and over time.

Mr. Friel: I did not specifically model a diabetes disease management program but the internal rates of return that we model vary, and often exceed 30%.

From the Floor: Over what period of time?

Mr. Friel: Usually five to fifteen years. When you start evaluating for fifteen years, the other decrements become zero. We've seen returns that high but again, there's wide variance with your assumptions.

From the Floor: Are you talking about actually experiential rather than actuarial projections?

Mr. Friel: Right.

From the Floor: I'd like to know in real terms, not generic, not theoretical, real.

Mr. Spiro: You mean you're talking my world instead of the actuarial world.

From the Floor: Yes.

Mr. Spiro: Clearly we're early in the phase of building disease management programs so most of the data that I've seen come only from one to two years because you really haven't had active disease management programs around longer

than that. The data that I've seen in that regard tend to be in congestive heart failure and some specialized centers dealing in asthma. Congestive heart failure, after taking into consideration the program costs, I see savings of around 10–15% depending on the program. In asthma, I've seen similar savings such as that, but they've only come from selected centers which have high expertise in asthma.

Mr. Robert H. Plum: My question is directed at the panel. I recently have had a problem in the oncology area, cancer area, and the advanced cancers where we have semi-disease management. The problem is that people are being asked to use experimental or very new drug treatments. There is a tremendous amount of confusion. I'm interested to learn what the medical ethics and views are in terms of health insurance and of at what point these are cost effective. We're not talking about life saving, we're almost into terminal care, but some of them appear to have a 20–30% chance of gaining a 3 to 4 year remission. I'd be interested to know what protocols are around on this, what people's views are.

Dr. Spiro: I guess I'm not 100% sure of what the question is. Are you asking if within disease management programs that are geared around cancer how you account for experimental protocols?

From the Floor: Yes.

Dr. Spiro: Most of the cancer disease management programs are affiliated with oncologists, many of whom are affiliated with broad trials for various drug programs so that becomes part of the norm. You get into bigger issues of what are called experimental and where it clearly is experimental and, therefore, does not meet the definition of what should be coverable under insurance coverage. It's less of an issue if you're just capitating to an oncology group that decides to cover it, it's a bigger issue when those decisions have to be made. I've clearly been involved in a lot of those decisions on individual cases, and I don't know of any one system or systematic approach to them.

From the Floor: That's the problem I have, I haven't seen one either.

Mr. Gibson: I have a question for the panel. Do you think we've seen the biggest demand yet for disease management programs, or do you see more demand for these programs in the future?

Dr. Spiro: Clearly with the advent of Medicare risk programs, with the Medicare Plus choice program, that's really the main place for many of these disease management programs. Incidents of diabetes, congestive heart failure is greater in

the Medicare age group. As that group shifts into managed care programs, I expect we'll see more and more of disease management programs.

Mr. Gibson: I guess a similar question for Mr. Korabik would be, do you think that Medicare eligibles will ever be included?

Mr. Korabik: Number one, we're not at risk for most of the Medicare eligibles claims costs. Basically half of the costs that we pay for are drug related, and these programs would increase cost significantly at the outset in addition to the program fees, and any savings from the medical claims would be accrued by the Health Care Financing Administration and solely Health Care Financing Administration. If we were able to arrange with Health Care Financing Administration to get into an arrangement where we could share some of that, then we would consider it. At this point, I don't know that we've addressed it.

Mr. Lynch: In connection with your last question about the future of disease management, I will make a prediction that there will be a larger and larger role assumed by intelligent software in disease management.

Mr. Gibson: Have you seen any good software programs so far?

Mr. Korabik: Oh, clearly. I kept stressing the importance of the information systems, and a lot of the interaction that goes on has to do with questions and support. There's really good computer software automated, artificial intelligence systems that deal with support for psychiatric patients, automated phone calls that remind people to take medications, etc., that are often not in the context of broader disease management programs, but are clearly out there as other types of programs and I absolutely agree 100%.

CHART 1
DIABETES CASE STUDY