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Variability in Health-Care Treatments and Cost

Track: Health

Moderator: Lisa F. Tourville

Panelists: Catherine M. Murphy-Barron
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Summary: Variability in health-care treatments and cost are among the key challenges facing the marketplace. Panelists at this session expand upon these topics, as seen in availability and affordability of health insurance, evidence-based care guidelines, disease management programs and service prices. In addition, panelists provide insights into the actuary's role in identifying, measuring and managing variability in health care.

MS. LISA F. TOURVILLE: The first speaker is Catherine Murphy-Barron. Cathy is a consulting actuary in the New York City office of Milliman. Her experience includes assisting clients with pricing, benefit plan design, cost projections, risk analysis and claim liability estimates. She helps clients with reimbursement and incentive system development. Cathy also assists clients with their regulatory filings and experience analysis. Dr. Tom Kravis is a senior consultant with Reden & Anders. He received specialty training in internal medicine and pulmonary disease at UCFD. He was CEO

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Note: All handout materials are available through the link on the table of contents.

for a physician practice management company for 25 years in San Diego and served as lead clinical consultant at M & R in San Diego before moving to Anderson in Chicago, where he directed managed care practice. I'm also a senior consultant with Reden & Anders. My specialty area has been focusing in the medical expense trend and in the analysis and forecasting.

Cathy is going to talk about variability in affordability, access, service prices and demand for health-care services. Tom is then going to speak about variability in practice patterns and treatments, evidence-based guidelines and disease management programs, a means to reduce variability. We'll have time at the end for questions.

A timely thing came out from health affairs just a couple of weeks ago. A collection of 20 papers offered new findings and commentary on variations of health-care practice patterns. John Lindberg and colleagues showed that 77 of America's best hospitals have widely varying treatment patterns for patients with three chronic conditions—congestive heart failure, solid tumor cancers and chronic obstructive pulmonary disease. James Weinstein and colleagues documented the persistence of regional variations and the frequency of surgery to treat degenerative diseases of the hip and the spine. Katherine Baker and colleagues recorded that the differences in end-of-life care are driven more by residence than by race. There are interesting things out there right now talking about the variability. With that, I'd like to welcome Catherine Murphy-Barron.

MS. CATHERINE M. MURPHY-BARRON: We're going to look at different aspects of variability within the health-care industry itself. I'm going to speak specifically about variability in service prices, access to care and demand. Then I want to see what impact these things have on the work that you do every day and how you can combat them in your work. I also want you to think about the impact that we can have in trying to reduce this variability in all these things. We have unique training and understanding of the way the health-care system works, and we can contribute to the debate and, hopefully, to the solution to some of these problems.

We're going to look first at the variability of service prices and what causes this variability. There is variability in prices between different geographic areas. Within any one area, you might also have different prices. The way an organization is structured might have an impact on the different prices. Also, where the procedure or service is given or performed has an impact on what is charged.

Let's talk first about geographic differences. Why is the price of a triple bypass different, say, in California or New York or South Dakota? The cost of living is a big item here. If you are running a practice in New York, obviously your rate is a lot different from the same sort of practice in Sioux Falls, South Dakota. That's a big difference between areas and a reasonable reason for a variation in price. Another thing that also can have an impact is the type of contract or incentives that are in place in the area where you are doing business. For example, in California there's a

much higher HMO penetration than there is in other parts of the country. In California, it's about 50 percent HMO penetration, whereas in other parts of the country, it's around 20 to 30 percent, so that has an impact on the pricing in that area.

Within one geographic area, you don't expect there to be a difference. Say you're in New York City and you want to have your procedure done. You don't expect there to be wide differences in cost between different hospitals, but it does happen. One of the things that might be driving it could be a financial decision on the part of the hospital. If in your area there's a health plan that has a huge number of enrollees, the hospital might want to be a part of this health plan's preferred network, so they might offer a huge discount. Thus it would be cheaper to have a procedure done in that particular hospital as opposed to somewhere else. That could be one reason. You might also have the opposite situation, where a hospital or an institution has such a huge reputation that they can charge whatever they want. People want to have this particular thing done at that hospital and will pay whatever it takes, so you have a much higher cost of doing business with this particular institution than with others.

Another thing that might also be driving variability is the way the organization is structured. You'll often find that a for-profit will have a different pricing structure than a not-for-profit organization. The same goes for academic institutions versus the non-academic institutions. The health-affairs articles referred to earlier have one paper on academic institutions. They're looking at just that thing. They seem to be saying that the differences in the pricing may not be totally justifiable even after allowing for the case rates and the co-morbidities, which have always been the justification for them having a higher price. They're saying that it might not always be the case if they just charge more. If you look at one academic institution compared to another academic institution, there's a difference there, without a big difference in the outcome or the quality that you get at the end of the procedure from the individual.

One of the other things that may be leading to variability might be where you're having the service performed. If you think about a procedure that's done in a doctor's office versus a procedure that's done in an outpatient facility, the outpatient facility has to cover higher overhead. It has to price a little bit higher to cover all those costs, whereas in the doctor's office the overhead is quite a bit lower. That could account for the differences in the pricing.

You also have to think about another type of facility that's become very popular and successful lately—the centers for excellence. They specialize in different procedures, become efficient and cost-effective at them, and the result can be cheaper. A number of studies have been done and prove that this is the case. Murphy-Barron Slide 1, page 5, shows low-volume hospitals compared to high-volume hospitals for different high-risk surgeries. It shows the estimated mortality rates for these procedures. The mortality at the high-volume hospitals is a lot lower for these high-

risk procedures than at the low-volume hospitals. This same pattern continues through to their pricing and their efficiency because of the sheer volume of services that they perform, even down to just being able to buy their medical supplies in bulk and get a bigger discount than a hospital that's not performing as many.

How does all of this variability in pricing impact the work that we do? If you're a pricing actuary pricing your products, these things are already inherent in the data at which you're looking. If you're using experience data, the variability is already there. You can make the assumption that it will continue on into the future, and it probably will continue. But I think it's important that we consciously ask the question, "What is going on here?" Is there an issue with regard to variability? Is it a reasonable issue? Is there something changing that might impact how the data will look tomorrow as opposed to how the data looked yesterday? The more we ask the questions and raise the issues, the more important it is. As to whether we can actually have an impact on that variability and make a change by reducing it or making it more reasonable, I'm not sure that we directly can, but perhaps we can if we just keep raising the issue. Every time it comes up, every time you see it, ask the questions about why there is this variability, what's happening here, is it reasonable and should it continue. If you keep asking the questions, eventually it comes to the forefront of people's minds and they start asking the same questions. In that way, perhaps we can effect a change and make things more reasonable.

I want to look next at variability in access to care. There are two different aspects of this: variability in access to health insurance and variability in access to the health services and facilities themselves outside of insurance. The pie chart in Murphy-Barron Slide 2, page 6, shows where the U.S. population receives its health insurance. The biggest piece of the pie is where the bulk of people get their health insurance: employer-sponsored health insurance. You work, and your employers provide you with your health-care coverage. The second biggest piece of the pie is the uninsured population. There are approximately 44 million people in the United States who do not have health insurance. However, a large percentage of this uninsured population are actually full-time employees. They go to work every day just like all the rest of us, but they don't have health insurance, either because their employer doesn't provide employer-sponsored health insurance or because they have made the choice not to participate and do not take the insurance coverage.

If you are uninsured and you get sick, you do get some care. Where does this care come from? The amount of care or the access to services that you have varies, depending, of course, on whether you have insurance or don't have insurance. Let's look at some of the particular types of health care that you might need. First of all, for hospital inpatient acute care, if you get sick, depending on the problem, if you don't have insurance, you can probably get the care that you need. You can probably have surgery if you need surgery, but you may not get it in the hospital in which you want to have the surgery. Then the issue is how you pay for it.

Another thing that's getting a lot of press at the moment is what you get charged

for it. Cost-shifting is something that has been going on in the health-care industry for a long time. It was an accepted practice, and we all knew about it. It was the way things were done. Suddenly, as more people are talking about it, people are starting to think that maybe this is not fair. The people who are the least able to pay for their health coverage are paying the most for it. Things are starting to change, and hospitals will have to change their practices and make the pricing a little fairer between different services. This has to do with what I was saying before about bringing up the issues. Keep bringing them up, and people will start talking about it. Sometimes you can effect change just because people are talking about it and they realize that it might not be totally fair.

What about primary care coverage? Those with insurance, of course, have primary care coverage from their health insurance. If you don't have insurance, where do you get your primary care? If you need care, you go to the emergency room. This is probably not the most efficient way to get your primary care. It's obviously more expensive than other ways, such as going to the doctor's office. It also causes crowding at the emergency rooms, which, when there are true emergencies, can cause issues.

What about preventive care? If you have health insurance, you probably have coverage for preventive care. Most health insurance policies currently cover preventive care some way or another. If you don't have insurance, you probably aren't getting your preventive care, because if you want to go to the doctor, then you pay for it yourself. This is particularly a problem if you have a chronic disease. If you have insurance and you have a chronic disease, you're going to the doctor, getting your regular checkups and having your disease monitored and maintained. Everything is fine. If you don't have insurance, you're not going to the doctor on a regular basis, and your disease is not being monitored. This will cause you big problems later on when you start having complications from not taking care of it.

You might think that there are lots of places for people who don't have insurance to get coverage. We have these safety net providers: public hospitals, community health centers, local clinics and some primary care physicians. There's a great deal of variability in the availability of safety net providers, depending on where you live in the country. Some areas have more than others. I recently discovered studies saying that if you increase the health insurance availability and you increase the safety net providers, then you are going to increase access to health insurance for the uninsured. However, increasing health insurance availability has a much bigger impact on access to services than increasing the safety net by that same dollar amount. This is because safety net providers focus on acute inpatient services and primary care services. If you have a chronic disease, you can go to your primary care physician, but you don't have access to the specialist that you need to take care of the things that are wrong with you. On the other hand, if you have insurance coverage, you have access to the whole range of physicians and services that you might need. Increasing the insurance coverage increases the availability of specialists as well.

One thing to remember is that insurance is still voluntary and you can choose not to enroll. A large percentage of the uninsured have the financial wherewithal to purchase insurance, but they have decided that the price of insurance is such that what they have to give up in order to have that coverage is not worth it as far as they're concerned. They choose to go without. If you have a good safety net provider network, it can have an impact on whether an individual chooses to enroll or participate in health insurance or not.

I'm lucky. I have employer-sponsored health insurance, and so I have no problem with access to services, right? Maybe not. We also have issues of the services not being available, whether you have insurance or don't have insurance. For example, there might be shortages in your town or your area. We all know about how difficult it is to get doctors in rural areas. They don't want to move to the middle of nowhere or to inner cities. If you live in a small town, the nearest doctor may be 60 or 70 miles away, and the nearest hospital might be 200 miles away. That's an access issue; you have trouble getting access to your doctor.

Budget cutbacks are also causing problems with access. Hospitals in particular, but other providers as well, are having problems with the money. Hospitals have had to close down parts of their facilities. Physicians can't afford the price of medical malpractice insurance, so they are choosing not to practice or take on any more high-risk individuals. Some hospitals are trying to come up with creative ways to help combat this budget problem. They are doing things like scheduling and smoothing the patient flow. A hospital sometimes finds that there are peaks and valleys with regard to demand for the operating rooms and surgical intensive care units (ICUs). Sometimes if demand is too high and a hospital doesn't have the beds, it ends up shipping them off to other hospitals and diverting ambulances. If hospitals monitor over a period of time where these peaks happen, they can smooth the scheduled patients. They have no control over emergencies and other problems, but they have control over the scheduled surgeries. So they smooth that to avoid a lot of the peaks and the pressure on the system, and they don't have to divert ambulances to other hospitals. It's just one way that hospitals are trying to creatively combat this problem.

The nursing shortage is also causing issues with regard to access. Hospitals are increasing salaries and providing signing bonuses, trying to get nurses to sign on to their facilities. But the pool of nurses is still limited, so that only moves nurses around; it's not helping the problem for other hospitals. They're trying to combat this by attracting young people into the profession. That is great, except that it's not happening fast enough. It's a long-term solution, not a short-term solution. Salaries need to go up and be sustained at a high level for a period of time in order for this to actually solve the problem. But if you suddenly had a huge influx of young people wanting to be nurses because the salary was triple whatever it is now, the current teaching hospitals and facilities don't have the capacity or the money to train them all fast enough. Obviously, it is going to take a while to solve the

problem. A short-term solution is trying to lure back some of the older nurses who have retired. However, because of the physical demands of the job, there's going to come a time where they're not going to be able to do the job, so that only helps with the short term. One of the newer ways that they're trying to combat the nursing shortage is by hiring foreign-born and foreign-trained nurses, inducing people to come into the country (assuming that they have the right level of education) and allowing them to work in our hospitals. This will help in the short term and the long term. Some of the nurses' unions are having some problems with bringing people in from the outside, but at least it's a way that they're trying to solve the problem. Obviously the nursing shortage issue isn't going to go away any time soon, so it has to be dealt with as well.

These first three items that I mentioned here are about limiting access. But what if you have a surplus of beds? Let's say that you have a surplus of beds in this particular hospital. The current culture and the financial incentives of our health-care system encourage medical intervention for the seriously ill, even if the evidence says that it might not get you a better result than not doing anything. We feel that we have to do something, so if the beds are there, they're going to be used. On the left side of this graph, you have the situation where there's a limited supply of beds. On the right side, you have an unlimited supply of beds. The same number of physicians was added to each of the different sections. They found that when there was a limited supply of beds, there was only an 18 percent increase in intensity for these additional doctors. But when there was unlimited supply, there was a 34 percent increase in intensity for the same number of doctors. If the beds were available, they were going to use them.

How does all of this impact the work that we do? The problem of the uninsured is not something that we're going to solve here today. It probably doesn't have a direct impact on the work that you do on a day-to-day basis, but this is one of the areas with which I feel that we as actuaries have to get involved. It's going to be a hot topic into next year with the new administration. Policymakers and lawmakers are coming up with plans that they think will solve the problem. We know what happens when somebody's plans are put into effect. We have to be involved in the discussions. We have to say that if you do this, that's great, and this will happen, so that everybody knows what will happen and we don't end up living with unintended consequences. We have to get involved with the discussion and hopefully contribute to the solutions.

With regard to the issues of access in the different areas, if you're an individual living in any of these areas, then obviously it has a direct impact on your life. If you're working in those areas, in pricing or whatever in your company, then it is having an impact on your day-to-day work. You obviously are aware of this, and it influences how you price your products.

One of the other variables that I'd like to talk about is variability in demand. Demand for health-care services represents the request of the patient or the

physician or the patient's family for health-care services. It's related to but it is independent of the medical need. Variability of demand is huge and costly. Tom will talk later about treatment patterns, why you have the same medical problem and two different treatment patterns and both have the same outcome, but they have different costs associated with it.

What I would like to talk about is reducing demand by improving health. It has been estimated that if we can improve health using what we already know, we can save as much as 20 percent of the cost of health care. If we can delay the onset of these chronic illnesses, we reduce the total cost because they're further out in your life span. Disposable illnesses make up approximately 70 percent of the burden of illness and its associated costs. Murphy-Barron Slide 2, page 10, shows the leading causes of death in the United States in the year 2000. Number one was heart disease, number two was cancer, number three was stroke and so on. Murphy-Barron Slide 1, page 11, shows the actual causes of those deaths in 2000. Number one was tobacco, number two was poor diet and physical inactivity, and number three was alcohol consumption. Those are three very preventable causes.

The current health system and the insured's plan design focuses on the short-term treatment of an illness. If something happens and you have an episode, you treat that episode. The demand for health care is driven by the providers of care, the system of care and the providers of pharmaceuticals. But it's not in the best interest of the individual to have an intensive medical service, because often the alternative is just the same outcome. Also, it's often against the best interest of the individual because the individual has more expenses or is out of work. In order to change this, the individuals must receive good information and good advice so that a good decision can be made. In the current system, there are many people who have a say in the ultimate utilization, and then you have huge variability in utilization even when you're talking about the same medical problems.

Can we have an impact on this demand variability? Will the current consumer movement increase or decrease demand? We know that a defined contribution health plan will reduce the variability of the employer's health bills, but will it reduce the demand and the cost of health care? Maybe, maybe not. If we can create a situation where individuals have good information, then we have one person making the best decision for his or her care based on what he or she feels is most important, without outside interests. If we can promote prevention as well as treatment so we can postpone the cost of some of these chronic illnesses, then they will have an impact on demand, on utilization and on cost. However, patients may not want to participate in the decision-making process. There have been some studies done that indicate that sometimes the patient doesn't want to know everything and doesn't want to be the one making the decisions. Consequently, those who are given the information may not use it, and you may not have the result that you want to have. In that case, you're not going to have an impact and they won't have the result that you had expected.

There are a lot of interesting consumer-driven health plans. I think they will have an impact on the work that we do, because there's so much interest in them. I think that we can have a big impact on the variability of demand by making the information available to those who want the information and can't currently get it.

I want to talk a bit about the role of health-care information and technology to link all this together. The U.S. Department of Health and Human Services, in its health IT strategic framework, identified these seven critical needs: avoid medical errors, improve the use of resources, accelerate diffusion of knowledge, reduce the variability in access to care, advance the consumer's role, strengthen privacy and protection, and promote public health and preparedness. Four of these critical needs have a direct impact on what we've been talking about today.

Improve the use of resources. The cost of our health care is going up and up and up without any stops. In order to pay for this, we have a limited amount of money, no matter how you finance it. We have to improve the way these limited resources are provided in order to be able to afford to have the kind of care that we want. The idea is that health information technology will lead to the development of innovative cost containment tools that will help with this process. One of the advantages that we're starting to see already with health-care information technology is more transparency in the system. This will help reduce the silo effect of many of our health-care systems. Through electronic medical records, every doctor or health-care provider will be able to see everything that has happened before. They will know what's going on, and you will avoid some of the duplication of diagnostic testing and procedures that happens when you don't know what has been done before.

Accelerate the diffusion of knowledge. On average, it takes 17 years for medical evidence to make it into clinical practice. That's a long time. Health-care professionals are finding it increasingly difficult to keep up with the changes in medical findings. Research has shown that physicians incorporate the latest medical evidence into their treatment patterns 50 percent of the time. Information technology will help the dissemination of this medical evidence, so hopefully we can reduce the 17 years and increase physicians' use of medical evidence in their treatment. One of the interesting things that I found out about is the electronic reminder to physicians. When a doctor comes across a situation in the electronic medical records that would be indicative of the medical findings that he or she already knows about, the electronic reminder says, "Remember this report you read the other day? Maybe this applies in this situation." Hopefully that 50 percent will go up. If a doctor is choosing not to incorporate it, it's because he made the decision not to incorporate it, as opposed to just forgetting that it was out there.

Reduce the variability in access to care. We talked about services not being available to people living in rural areas. If somebody who lives in a small town in Wyoming needs to see a specialist who is in Seattle, the person can go to his or her local doctor through what's called Web-based communications. They can have a

conversation with the specialist in Seattle without the specialist leaving Seattle or the person leaving Wyoming, and they can do all the diagnostic testing electronically. The services have come to the person who couldn't get services previously. In addition, if you have an illness that needs constant monitoring, now we have machines that a person takes home. The person hooks up to the machine, hooks the machine up to the phone line, and the machine does all the testing and sends the information off to the doctor. The person doesn't have to keep running to the doctor's office, and the doctor gets what he or she needs on a timely basis. It's also helping in continuing education for doctors. If a doctor is in a rural area, he or she can't leave that area for a week to go off to a seminar, because there's nobody to cover the patients. These Web-based continuing education programs allow doctors to get their continuing education and continue to work for their patients.

Advance the consumer's role. More and more people are looking to the Internet to get information on health and their medical treatment. As this becomes more available, this gives people the information they need in order to make the decisions that we want them to make. Also, more and more information is being provided about the performance of their health-care providers. As this information becomes more available, they'll be able to make decisions that make sense based on what they know. Is the variability between the doctors reasonable? Why is this doctor doing this? I don't like that; I'll go to this other doctor. Eventually these things will be smoothed out through the demands from the people and what they see in their information. All of these things are necessary in order for the consumer-driven health care to succeed.

I talked about variability in prices, access and demand, and so now I'll hand it over to Tom to talk about some of the other variability that we have in our health care.

DR. THOMAS C. KRAVIS: I'm going to start where Catherine left off. She talked about prices, access and demand. We're assuming now that the patient has received the service. We're going to talk about some examples of variation, the role of evidence and, perhaps more importantly, once you see the variation, what's causing it and what sort of actions you or your clinical colleagues can take to mitigate or influence that variation. I'm going to talk about background and current environment. I'll give a brief description of evidence-based guidelines, lots of examples of variation, some examples of how to identify, target and quantify the variation, and the value or the dollar amount of that variation. I'll share some thoughts about how severity-adjusted data is important, interpreting the data when you have variation and, lastly, some comments on how to manage the variation.

What is evidence-based medicine? It's very important because it links the clinical practice and evidence and policy decisions by payers of Medicare and private health plans. It influences the payer's decisions about what is covered. Evidence-based medicine must be valid. By that we mean the extent to which the findings can be extrapolated to other patient populations, providers or settings. Vioxx was a great example of what the evidence showed. The financial analysts down the street are

already talking about how that data can be extrapolated to other COX inhibitors. The same is true with any other technology or service we provide, where we find some evidence and try to extrapolate it to the greater population. Sometimes you can do that, and other times you can't.

When we look at data on risk factors, sometimes we don't have past medical history in that data. We know nothing about provider skills, the community resources or the infrastructure. You may be familiar with the state mandates in a particular geographic area and the benefits covered, but in other instances, the user of that information is unclear as to some of these risk factors. The key here is that there is wide variation in evidence and the levels of evidence. There are several different levels of evidence, the gold standard being the randomized clinical trial, but there are other levels of evidence we use day in and day out to decide coverage benefits and when a particular service is appropriate.

When you have the evidence, how is the evidence deployed and implemented? What are the rules that monitor whether or not that evidence is adhered to and what sort of compliance is there on behalf of the physician and the patient? All of those will introduce new opportunities for wide variation.

Let's talk about a major driver of trend—coronary artery disease and angina. Kravis Slide 2, page 2, looks at per member per month (PMPM) episode of care costs in this particular year of these two variances—low back pain and coronary artery disease and angina. When we talk about total episode care, we're not just talking about inpatient care or discharges for coronary care. We're talking about the entire episode, meaning the outpatient, the inpatient and the post-acute care. We can see that there is a wide variation in the dollar costs and the annual growth in episode of care for that particular type of disease. It's important to target when you're looking at variation, as you can't look at all the spreadsheets. You want to target and focus on areas that are common, have a high dollar impact, where there's an adverse trend, where there's some evidence-based medicine or some other evidence that can produce actions that can mitigate such change. If it doesn't have these characteristics, you can spend a lot of time looking at little blips in the data with wide variation and a lot of time with your actuarial colleagues and your clinical colleagues trying to figure out why is it happening and what to do about it.

Kravis Slide 1, page 3 is an example of looking at coronary artery disease using a tool called an episode treatment grouper (ETG). This takes hospital or physical or pharmacy claims, takes all the services that the member has obtained over a period of time and produces a profile or a characterization of the care that member has received. In this particular example, we're looking at chest pain. The patient was seen in the office, given some pharmacy, had an x-ray, had some more chest pain, had an evaluation and management claim from his doctor, had an exercise treadmill test, was hospitalized for a percutaneous transluminal coronary angioplasty (PTCA) and had some follow-up care. All this data then is created to capture all the diagnostics and treatments into an episode treatment group. We used the group to

then compare the observed care of that patient with angina with best practices, with the evidence and with peers.

On Kravis Slide 2, page 3, is an example of how we do that. To identify a patient with chest pain, we ask what evidence suggests are the best practices and what practices should that patient have done that would be considered best practices. The tool then allows us to observe the claim. If it has captured all that data, it can compare what actually was observed to the best practices. Lastly, there's a report that will give the variation and that says this doctor did not do a treadmill after this inpatient hospital procedure three weeks after discharge, and the evidence suggests that would have been good medicine. Rather than beating up physicians and reprimanding them, our view is that we don't profile providers. We share data with physicians and say that this is what the evidence suggests. Help us understand why, in this particular example, your behavior is different from that. We find that it begins to influence the physician, particularly if the evidence suggests the best practice and if there is evidence that their peers are also practicing that best practice.

I talked a little about the rules and the variation not only in the level of evidence, but in the rules that the software companies such as Ingenix develop. The rules look at the evidence and then apply the rules to the claims. You can manipulate the rules to give you the kind of profile you want for a particular doctor just by changing the rules. This is a very important part of the variation, because you can decrease or widen the bell curve depending on these rules.

Kravis Slide 1, page 4, is an example of a case of angina. You have a description of a clinical measure, and the particular service you're looking at is exercise treadmill testing. You have a rule type, you have different report rules, you have different categories and then you can flag this, depending on whether you think it ought to be done for every patient as a procedure or only for patients over 40. The variation in rules implementation using these episode treatment groupers can either increase or decrease the amount of variation that you have.

Kravis Slide 2, page 4, is probably one of the best examples we have and probably the one you will remember. In this particular example, we use two different tools to look at variation in physicians. We looked at Doctor A and Doctor B. We looked at this same patient—a patient with chest pain who came in and got evaluated, had a cardiac CAT, had a stent, had some follow-up and so forth. The group followed this care for these two doctors over that period of time. The costs for inpatient care for Doctor A and Doctor B were identical because this is a fixed-reimbursement contract. So the cost for the inpatient care had nothing to do with the doctor, which is important to remember because often physicians' profiles or data-sharing characteristics are determined on what the charges were for some party where they had no influence, in this case the hospital. If this were high, the doctors might get dinged because they're practicing high-cost medicine.

The other important point is that there are marked variations and differences between Doctor A and Doctor B. What we found in some of our work is that physicians can look very efficient on the inpatient side but look very inefficient on the outpatient side and vice versa. There are doctors who provide outpatient medicine efficiently, but you throw them in the hospital to take care of a patient and they're not so good, and vice versa. There are some good inpatient physicians who, when you get them in the office, have practice patterns that are entirely different. A profile or report ought to use an episode treatment grouper in order to get the entire picture; otherwise you're just looking at bits and pieces.

Kravis Slide 2, page 5, 26 for the state and a third of that particular client's inpatient days could have been avoided.

Why are there variations in those surgical days? Kravis Slide 1, page 6, is an example from another source. It looks at variation in cardiac surgery unit cost and the length of stay. The standard deviation compared to the mean of the unit cost is in white, and the length of stay is darker. There's wide variation in both unit cost and length of stay. If you looked at the total days and the total cost, you would have to drill down and ask, "Where is the variance and what is the variance that I can fix?" This type of analysis assists in leading you to that conclusion and that solution.

Kravis Slide 2, page 6, is an example of some severity-adjusted data from the Northwest. This is a 3M product called the All Patient Refined-Diagnostic Related Groups (APR-DRG). It divides patients into four levels of the risk of mortality and four levels of the severity of illness. It allows you to compare apples to apples. All the patients for this category, coronary artery bypass, were exactly the same in terms of their risk for mortality and their level of severity. That's important, because if you show this without severity adjustment, the physician would say, "But my patients are sicker." This slide looks at patient day variance and their resource consumption variance in dollars. The size of the bubble is related to the volume. You can see the numbers of days is less for the patients who are seen at some hospitals as compared to others. These are the higher-performers; they are low cost and fewer days. Other hospitals have higher cost and more days. You can look at the doctors underneath that data and at who is responsible for what kind of days and what types of costs. Catherine talked about high volume versus low volume. It's generally agreed that high volume is usually better care.

Using the APR-DRG again so we're comparing apples to apples, Kravis Slide 1, page 7, shows the difference in variation of department costs at eight hospitals in North Carolina. These are all hospitals within a stone's throw of each other. The cost per day varies widely for the same disease. The slide shows coronary artery bypass cost per day for the same patient. It varies widely in North Carolina, and this is not uncommon in other geographic areas.

Kravis Slide 2, page 7, shows specific departments where some of those variations

are seen and why, again using severity-adjusted data. We're looking at the revenue codes from UB-92s, and dollar and cost amounts. We're looking at medical/surgical types of bed days, ICU, pharmacy costs, radiology and labs for each of these different hospitals. Even a clinician, and perhaps an actuary, could see which particular graph sticks out. The question is, why is that hospital experiencing such great ICU/critical care unit (CCU) costs? The reason is that the hospital is not using their medical/surgical beds. Medical/surgical beds cost about $800 or $900 or $1,100 a day, and ICU costs $3,000 or $2,000. There's an incentive for this hospital to have higher charges. It may be that it's short-staffed on the floor. There may be lots of reasons why this is occurring, but the reason the costs are so high is that the hospital is using more ICU beds in proportion than medical/surgical beds, which are less costly.

We want to quantify those potentially avoidable ICU days by looking at severity-adjusted data. In Kravis Slide 2, page 8, we looked at minor, moderate, major and extreme levels of severity. We looked at all the days and all the dollars for the ICU days, and we looked at all the medical/surgical days and dollars. It's the minor and moderate and perhaps major that have the greatest opportunity for savings. It's not the really sick people. This is important, because when you go to the hospital and you talk to the physicians and talk to the purchasers, if people are really sick, we're still going to take care of them and we're going to pay for it. But why should this patient with a minor problem spend a week in the ICU when evidence says that all the patient needs is one day or maybe no days? Maybe the patient would do better on the medical/surgical floor. That's what we usually find when we do chart reviews. These patients that aren't so sick are admitted to the ICU because there's a demand that needs to be filled.

Catherine mentioned that there are more hospitals in California than elsewhere, and that's probably true. Kravis Slide 1, page 9, is an example of managing variation in the ICU and the length of stay using guidelines by the hospitals. In this example, we looked at care rendered by using guidelines, no guidelines and benchmarks, and again looked at minor, moderate, major and extreme severity. Looking at length of stay, it's clear that if there's a use of guidelines you reduce the length of stay for minor by almost three days. In each example thereafter, the use of guidelines is associated with a reduction in the length of stay. This is not an uncommon finding.

What about mortality? Bill Clinton had his bypass done up here. The press asked why he went to that particular hospital. A lot of us asked the same thing, because if you look at some of the publicly available data, he might have gone someplace else. If you look at *U.S. News and World Report* as a report card, you would ask, should one go to this hospital for this procedure or not? Mortality is an important part of report cards. I want to share this wide variation in mortality by year in a particular hospital over four years, 1999 through 2002. An analysis of the mortality by major diagnostic category (MDC) 5, circulatory diseases and disorders, for each year showed that in 1999, it was 20 percent below the state average. The next year was 3.5 percent more, the following year was 25 percent less and the following year was

12 percent more. Much of this data that you get is a couple years old. So if you are Bill Clinton, or you're advising your patients or your mother, where are you going to send them? The point is that there's wide variation. Sometimes the information is old, and you have to look at things like trends and even specific diseases.

When we talk about quality measures, it's hard to fudge a death; when someone dies, it's hard to say that the person didn't die. But when you discharge a patient, the documentation and coding influences what that claim is going to look like and how much variation there may or may not be. Kravis Slide 1, page 10, shows variation and complication rates at seven North Carolina hospitals from MedPAR data. Look at the 80th percentile. It shows what they claim is their complication rate. This is adjusted, so, again, it's apples to apples. It appears as if there's a large difference between these hospitals. In fact, some of these differences have to do not with that the patient had fewer complications, but that the doctor didn't chart it or the medical records didn't extract that information from the chart and document it well.

St. Vincent's is a hospital right up the street here. In public information, they have some data out there that says if you have simple pneumonia and you go there, your likelihood of dying is much higher than someplace else. It is probably because when they code, they code simple pneumonia rather than more complex. If they were appropriately documented, one might theorize that their level of severity would be higher and their risk-adjusted mortality rates would look much better.

Kravis Slide 2, page 10, shows some variation of quality and length of stay. It shows length of stay compared to expected and complication rate. We talked about coronary artery bypass, but if you want to fix it, each variation you see is provider- and condition-specific. You can't go into North Carolina at that one hospital and say that all the doctors there are bad. It's only the surgeons that are bad, and actually it's only some of the surgeons that are bad. You have to manage the guidelines and it must be condition- or provider-specific.

Kravis Slide 1, page 11, is an example of percentage of days and percentage of dollars. There's a difference between the number of days and number of dollars, which is variation number one. Number two, if you look at the different medical conditions, there's variation in each hospital for how many circulatory days and circulatory dollars they have, as well as for all the other conditions—ortho, GI and newborn. We encourage you, when you're looking at variation in hospital, not to look at average length of stay or average cost. We encourage you to drill down the MDC and then the DRG, and maybe if you have the two, it would be APR-DRG and then subsets of that APR-DRG by provider. If you're going to do something with benefits, provider education or contracting, it ought to be directed at the problem. In many instances, it's provider- and condition-specific.

Kravis Slide 2, page 11, is an example of variation and statistical significance of a report from a large, well-known nonprofit organization that issues state-mandated

reports to its hospitals and doctors about mortality. For hospitals A through I, you see the observed mortality rate per coronary artery bypass, and you see the risk-adjusted rate. This is what it should be. At Hospital D, a 5.8 rate compared to a risk-adjusted rate of 1.67 is probably not very good. Hospital G is better—3.15 versus the risk-adjusted rate of 4.19. But look at the other column over. While one is statistically significant, one is not, so it's not just the data that's important, it's statistically significant.

I want to talk about variation in billing practices. Kravis Slide 2, page 12, looks at neonatology trend in a single market versus the national trend. You can see the neonatology percent increases in this period of time compared to what the trend ought to be and what the trend is in other areas. The up-coding by four doctors accounted for the differences in trend between single market and the national average. Four doctors were inappropriately coding lots of patients. They had busy practices. We calculated that reducing variation in billing and avoiding inappropriate practices such as this could save a 25,000-employee organization $7 million annually.

Kravis Slide 1, page 13, shows variation in use of technology. This is from Lisa. She has developed a product called "Pipeline" that allows one to look at new technology, new bio and new pharma, and calculate what new things are coming down the pipeline and what you ought to do from an actuarial point of view. Here is a quote from *Managed Care Magazine* in 2004: "The predominant factor relates to the development and utilization of new medical techniques." The key here is utilization. The question is, what do you do and how do you evaluate the technology? If you look at technology and your analysis is that it increases the quality of care, your action may be to encourage its adoption, because your members may get better care and the outcomes may be cost-effective. If there is a therapeutic advantage when appropriately applied, the action should be limited to the appropriate population. If the therapeutic advantage is unproven, then the action would be to restrict or control the utilization. Using these types of reports, if you had a 25,000-employee organization, you would save approximately $10 million annually.

Kravis Slide 2, page 13, shows another example of variations of physician practice patterns of prescriptions. In South Florida, a health plan had a report that showed wide variation in particular doctors prescribing growth hormone. We looked at the age of the members to whom they were being prescribed. They were adolescent males. A headline from the Jacksonville press was "National Physician Group Debunks Human Growth Hormone 'Fountain of Youth' and 'Super Athlete' Claims." There were doctors and dentists down there prescribing this to rejuvenate their patients. Six percent of the doctors were issuing 60 percent of the prescriptions, and one was contributing 25 percent of all the g be a $2.7 million savings to a typical plan.

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Kravis Slide 1, page 14, shows the impact of evidence-based guidelines on implantable cardioverter defibrillators. The implantable defibrillators cost about

$25,000 and have been approved by the FDA. But Medicare says that it's not going to pay for them for patients who have an irregular heartbeat. There's a new study that strongly suggests that the defibrillator can help patients with heart failure, so a lot of health plans are now saying that it's okay to use this $25,000 treatment for heart failure. The problem is reimbursement. Medicare doesn't reimburse the cost of the defibrillator. If a lot of doctors start changing the reasons for implanting them, this is going to have considerable impact on the hospital, the doctor and the health plans where someone is going to be seeking reimbursement for those. That's an example where evidence changes what a technology may be good for, and the demand is the patient, or perhaps the member, saying, "I want this new defibrillator for my heart failure."

We talked about cardiac disease and about the wide variation for cardiac procedures, such as coronary artery bypass. One of the strategies here is what Catherine referred to as a "center of excellence." In a center of excellence, one looks at quality and cost and says that if a hospital and the physicians there are of this quality, we're going to sit down and talk to them. But if they don't have that quality, we don't care what the cost is—we're not going to contract with them. You've got to not contract with them or you've got to change or influence their behavior so that they move from the lower quality and higher cost to the higher quality and lower cost. You can have an incentive in your benefits design so you drive and stimulate members to select the hospital that's the highest quality and lowest cost. Some plans are doing that very effectively and have engaged the purchasers—the Deltas and the Home Depots—to sit down at the table. Then they can tell their employees go to this hospital because it's cost-effective, and if they don't, it's going to come out of their pockets.

The main strategy is to reduce cost by reducing variations. We can talk about sending the right patients to the right hospital or to centers of excellence, implementing evidence-based guidelines, plan design, benefit design, inappropriate billing, doing audits to make sure the physicians are billing appropriately, looking at the new technologies and saying what works and what doesn't and what should our members really be having for their care. Understand that variation can mean disregard for standards of care and addressing problems can improve quality and reduce costs. The bottom line is identifying the variation, and if there is variation, it strongly suggests that there's a deviation from evidence-based guidelines and the best possible outcome for the patient.

MS. TOURVILLE: Thanks very much to both Catherine and Tom, and thank you very much for coming.