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Session 79OF Trends in Large Claims

Track: Health/Reinsurance

Moderator: G. RUSSEL HUGH
Panelists: PATRICK L. COLLINS
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TIMOTHY K. ROBINSON

Summary: Correctly estimating medical trend is critical to correctly pricing, managing and reserving for medical blocks of business. This is particularly true with large claims, and even more so as the deductible level increases, due to leveraging. Panelists and audience members give their views on topics including recent large claims experience, frequency and severity components of large claims trends, pricing, reserving and the outlook for the future.

MR. G. RUSSEL HUGH: We've preselected topics for which we have prepared discussion materials. They include recent experience and frequency/severity components of trends, provider contracts and reimbursement rates, case management and utilization review, predictive modeling tools, drivers for the future prescription drugs, and reserving for large trends.

Tom Doran is with Hartford Life, in Simsbury, Connecticut. He's assistant vice president and director of Underwriting and Actuarial Services with The Hartford. He oversees all financial activities for The Hartford's stop-loss products, including risk selection, management, maintenance of underwriting guidelines and pricing.

Patrick Collins is a vice president with American Re in Princeton, New Jersey. He works as reinsurance underwriting managing both quota share and excess reinsurance programs primarily for small to midsized carriers.

Tim Robinson is a consulting actuary with NiiS/APEX Group Holdings in Princeton, New Jersey. He consults to help insurers and reinsurers managing general

underwriters, plan sponsors and providers. We have a diverse panel with perspectives from reinsurance, a direct writer and the consulting world.

Our first topic is going to be recent experience and frequency/severity components of trends.

MR. THOMAS A. DORAN: We do stop-loss reinsurance. We're self-funded at this point in time. We have 1,000 core groups. We write in the 100- to 2,000-lives marketplace. We have about 800,000 employees currently reinsured under our programs at this point in time. It's definitely a national program; it's administered not by the Hartford, but by other carriers and third-party administrators (TPAs).

To look at the analysis that was in the health section news, we tried to replicate that analysis that used three different break points: \$250,000, \$500,000 and \$750,000 excess limits. It was interesting to go through that analysis, because it was just a different way of looking at our historical claims experience. We actually saw some differences that I'd like to go through. Basically, our overall claims experience was a little lower at those excess levels, almost at each and every one of those excess levels. We actually saw some different patterns in terms of severity.

I looked at the \$250,000 and \$500,000 excess limits. The \$750,000 excess limit was thrown out because there wasn't a whole lot of claims experience. You're talking literally about a handful of claims, so any sort of trends there were really tough to come by. At the \$250,000 excess point, we actually saw almost a doubling of claims from 1998 to 2000. We literally had 88 claimants over the \$250,000 claim point, which almost doubled to 146. It was a pretty sizable increase, we think due to leveraged trends kicking up over a period of time. In terms of increased utilization, some really sophisticated technological techniques have been made to prolong life, especially for premature infants.

At the \$500,000 level, the results are pretty low. Frequency there is definitely very low. We have 11 claimants in 1997, and 20 in 2000–2001. So while the percentages ramped up, you're talking very, very low numbers.

Severity surprised me a little bit. The average claim for those people going over the \$250,000 deductible level was around \$126,000, and that was very stable. That definitely surprised me because you're talking about hundreds of claimants, which makes us pretty confident in those data. The \$500,000 deductible level was very erratic and kind of all over the place. With regard to some of the differences that we were trying to rationalize in terms of the Society of Actuaries article, we were thinking that there's definitely a difference in terms of it being one underwriter versus multiple carriers. We also used only complete years of experience. We didn't do any sort of completion adjustments or anything like that. So we felt pretty good about our data. I don't know of any sort of limitations that were used in that article. So again, the stability of the \$250,000 level really surprised me.

We also looked at frequency and severity on a diagnosis basis for four different policies. We looked at 1998 through 2001 on a frequency basis. Five items make up roughly 50 percent of our overall claims. Cancers and heart disease have been fairly constant over time. We have 20–25 percent of the cases as cancers. About 15 percent of the cases are heart disease. We did see an increase in the premature and newborns, which I think speaks to a lot of fertility treatments and, again, that enhanced technology. I guess I would expect that to continue to make up a bigger and bigger percentage of our overall claimants. The fourth item is transplants, which make up 1–2 percent of the cases. Those are very small numbers that speak to the very low frequency of transplants.

Then we considered severity. What we looked at there again are those same five diagnoses and their relative impact in terms of the dollars that we pay out. The transplants, cancers and heart disease are roughly comparable in severity on the claim payment basis. The numbers of premature infants have skyrocketed, going from 7 to 13 percent of our total dollars that we see going out the door. Of the top 30 claims that we have, half of them are made up of premature infants. If I were to list cases in terms of million dollar claims, half of the top 25 would be premature infants. The transplants would make up the next 10–15.

The number of claimants we see requesting transplants are definitely on the rise. We get early claims notification of people who are potential transplants. Last year we got almost 300. The increased technology and the ability to keep people alive and waiting for organs is definitely going to impact our large claims going forward.

MR. TIMOTHY K. ROBINSON: We tried just to summarize over the last several years what the rates of change have been in solid organ transplant frequency. Our data were fairly consistent with what Tom had just said, as the percentage of claims that have been made up of transplants hasn't really changed much. The growth rate has been pretty stable over the last 3–9 years, at about 4 percent overall. There's some variation by organ, obviously, and the dynamics and growth of the size of the waiting list are probably what's going to really affect us going forward. We'll talk about that when we get into some of the drivers of the future a little bit later on if we have some time.

I would like to go over some population data on neonates that might help to explain some of what people are seeing as far as neonate frequency. The data are publicly available data from the National Vital Statistic Reports from the Centers for Disease Control. The percentage increases have been in both preterm and low-birth-weight babies over the last 10–20 years. We actually did notice that there was a decline in 2000 compared to 1999 for the percentage of preterm birthrates, which depends on what you want to speculate. We did notice that the frequency of births of three babies or more has actually gone down. This seems to be what's driving that, which could be related to better success with assisted reproductive techniques and things like that. We'll continue to follow that trend. The correlation of single births to low birthrate weights has been stable. It tends to point even more heavily to the cause

of the increases in low birth weight being related to the higher incidence of multiple births.

MR. PATRICK L. COLLINS: Just in the way of background, the type of business that we reinsure basically can be broken down into the market segments of fully insured medical and stop-loss business. We also have a somewhat significant amount of government-sponsored business including municipalities. We have a little bit of standard excess and some managed care excess as well. Most of the volume of our experience is actually with small to midsized group employer business. Most of that business, if I had to distill it down to one type, would basically be fee-for-service PPO plans that mostly utilize rental networks. The analysis that I've done so far is based on our own claims database. We have a fairly comprehensive industry claims database. Our industry database hasn't incorporated the 2001 detailed data, and our internal claims database isn't entirely complete for the 2001 data.

As far as 2000 results go, I think both the frequency and severity components held no surprises. We noticed increases on both parts. What we particularly noticed was a significant increase in inpatient hospital utilization. We noticed that in the 2000 data the severity number wasn't as high as expected. For the outpatient hospital data, we noticed a high frequency number. With respect to physician services and prescription drugs, we noticed an expected increase in both the frequency and severity of claims.

Going into 2001, we saw a spike in our own experience, and then another spike toward the end of 2001 into 2002. It did seem to tail off toward what we would consider to be more normal or average numbers. When we broke down the experience by disease category, we have the classic top three nontraumas, which are cancer, cardiovascular and neonatal. As far as comparing these three categories from our own experience to our industry database, we noticed that we have on a claim cost basis a slightly higher cancer cost and a lower cardiovascular cost than the industry. We also broke out the neonatal experience by the size of the claim. We noticed that compared to the industry on the smaller size claims, our data were higher. We also noticed that on the larger neonate claims, our experience was lower.

I also took a view of the data and tried to get a sense for what these trends are over time. When we compared 1998, 1999, 2000, and what we have so far in 2001, we noticed that on the cancer and cardiovascular side we've had somewhat steady increases from year to year. On the neonate side, we noticed that we had a pretty good spike in the 1999 data, and in the 2000 data we actually had somewhat of a dip back down to the normal level. The interesting thing there is that we noticed that our experience for our neonate claims in late 2000 and 2001, where we don't quite have the numbers yet, are significant and still on the rise. We also suspect that the increases were due to infertility treatments. It's also important to note that most infertility treatments are not covered under the plan. We noticed that regardless of whether or not people have insurance, they're still getting the

infertility treatment. We're also noticing that the frequency of hypertension and diabetic-related conditions are on the rise. We also suspect that we are seeing the impact of the combinations of these two and co-morbidities as well. Finally, we are noticing in 2001 and early 2002 slight increases in bone marrow transplants and stem cell transplants as well as a slight increase in hemophiliac claims.

Going into 2003 and beyond, in terms of breaking out the claims into hospital, drug and physician components, we seem to notice that the inpatient and outpatient hospital trends may decelerate, while in 2001 and 2002 the costs were going up. We're also noticing and expect a similar pattern in drug costs. Basically due to the classic reasons that you may see in some other presentations, the health plans are doing a somewhat better job of managing the copays and the mix of brand and generic drugs. If we had to break down a common drug benefit, it's generally a \$20 copay for a generic and either the same or higher copay for the brand names.

On the physician side, we tend to see, on a macro-level, the supply of physicians remaining strong and growing. Although providers caught up in 2001 and 2002 from some past underpayments, we don't expect those trends to continue, at least for the next couple of years.

MR. CHARLES CRISPIN: Does anyone on the panel have any comments as to impact of hepatitis C on liver transplant incidence or any other costs associated with that?

MR. DORAN: One of the numbers that we've seen specifically for the impact of liver transplants is the potential for anything up to maybe a 500 percent increase in demand for liver transplant. The increase is not necessarily for the number of transplants, because of the limits on organ availability. But the potential is huge if the organ supply can catch up to demand.

MR. BRUCE BUTLER: Is each premature child treated as a separate claim? Do you group them as one overall claim?

MR. DORAN: We look at each child. They're all treated individually.

MR. COLLINS: We're looking at per life in terms of excess layers, etc.

MR. RICK PAWELSKI: Do you have any response to the recent study that neonate admissions were correlated to supply of neonatal facilities, and is that getting factored in?

MR. DORAN: I think that's an interesting correlation, and I haven't done any specific study on it.

MR. ROBINSON: To the extent that there is a strong correlation, there could be something related to availability of supply and increased demand just due to the

fact, whether through advertising or encouragement, etc., that the facilities and services are available.

MR. HUGH: Our next topic is provider contracts and reimbursement rates.

MR. ROBINSON: If you work a lot with stop-loss programs, you probably noticed that hospital payment structures are, putting it mildly, disadvantageous for catastrophic claims. This gets back to the outlier provisions that typically are in place. When you read the fine print, you see that everything that's excess of a certain attachment point becomes maybe some relatively minimal discount from charges, which you really can't quantify.

With specific types of catastrophic claims, especially when you get into things like organ transplants, tissue transplants and neonates, what you hope to do, ideally, is to align the incentives as best you can for appropriate care and cost control. With neonates, for example, maybe you could use step-down units, which would hopefully be at a lower per diem rate. The same thing could be used for trauma cases. If the case is being managed appropriately and the person can be moved into lower levels of care at a lower level of cost, hopefully that leads to better outcomes and lower costs.

You need to have consistency across service categories. An example would be a tissue transplant, where it may be done at one facility on an outpatient protocol versus an inpatient protocol in another facility. You need to really evaluate in terms of what the cost and risk is and what that means. It has an impact on who may be at risk if the services are not in a different place. But also, the impact on overall cost may not be what you would think just depending on the specifics of the facility and what their protocols are. So there's a lot more to look at than just what the discount is, or what the per diem rate is.

I wanted to put together an example of a global case rate that would cover facility charges, professional charges, and organ procurement, and then it would have an outlier threshold, which ideally would be based on number of days rather than charges. How is the person who is evaluating the risk or the adequacy of that contract going to go about doing that? You need to be careful to consider the interaction of different factors such as whether the outlier threshold goes up and how that offsets a change in the case rate. In one particular example, raising that outlier threshold was equivalent to dropping the expected overall cost. So if you were evaluating different offers or different contract structures from a transplant network, you'd have to be careful with your model in understanding how those different things are related. To do this kind of analysis you need to know what the contract terms are and have length of stay and continuance dates for each of the transplant times.

MR. COLLINS: I decided to focus on the experience that we've had over the last couple of years with inpatient and outpatient hospital care. As I indicated earlier,

we were noticing that the charges for the inpatient and outpatient hospital services are showing an increasing trend. Most of our business utilizes fee-for-service PPO networks, where they have this sort of outlier provision in there as well. We're noticing that the billed charges, as well as the contracted rates, are going up. A couple of the issues that we're looking to get our hands around are the lack of adequate controls by most of our client companies and the lack of tracking mechanisms in place to track the changes over time of both these provider contracts and the hospital billing rates. My experience with the rental PPO networks is they've historically been somewhat reluctant to share their fee information with you when you're trying to set your relative factors and rates for them. Those that do share that information with you don't necessarily help solve the problem over time. Tracking those changes over time in a consistent and meaningful fashion is what I'm really trying to do.

In the past this really wasn't as much of a problem when you had an environment of stable and decreasing fee schedules and billed charges. But given that that's not the case now, putting these controls in place is really the challenge that we're working our way through. We've had some experience with some consulting firms that have tried to fill the void with surveys or mechanisms. These are okay, and they're a lot better than doing nothing. But I still haven't seen even those versions as being comprehensive and practical enough. I think that if you have your own network, you have some advantages because you have easier access to the data. If you don't have that tracking mechanism in place, though, you suffer the same problem. We're trying to get a tighter link between the cost of care and our pricing. We are also trying to minimize the cyclical nature of the business. To illustrate the point, by the time you figure out that your claims are worse than expected, you have to take actions to fix the problem. You also then have to figure out whether you've gone far enough, and the cycle continues. I'm trying to get a tighter link between the cost of care and the prices involved.

MR. DORAN: In terms of my comments, we definitely are at the beginning of doing exactly what Mr. Collins talked about in terms of reanalyzing where we are with hospital contracting as it pertains to stop loss. Right now, when underwriters are making decisions, they really look for discontinuities in networks. They look at maybe going from a regional network that has good discounts to perhaps a Blues network with steeper discounts. They'll take that into consideration on a desk-level basis. That said, all of our claims are hitting the outlier. I almost hate to use the word "all," but it's pretty much a certainty that they're going past that \$30,000 mark when they're hitting our individual specific stop-loss protection.

We are beginning to go down the path of gathering data at the network level and at the hospital level. We are starting to look at the per diems, the length of stay by PPO and by hospital, so we can actually get a sense of the efficiency of the network in place as it relates to individual specific stop-loss claims. That's going to be a lengthy process, but we are working with our third-party administrators to grab those data for us.

We're also in the process of working to bring in some premeditated networks where the outlier provision is no longer an issue. Basically there's a flat per diem in place. Therefore, instead of the 20 percent off of billed charges that you typically see at the outlier, there's a flat per diem that would pay a little bit more below the outlier provision and a little bit less above it. All in all, it is supposed to be a cost-neutral decision for that hospital. So we're starting that in Texas and Illinois, and we'll let you know how that goes in a year.

MS. SUSAN MAXWELL: My question pertains to inpatient hospital reimbursement. I come from a company that writes a lot of stop loss, primarily over rental networks. As we're seeing a lot of recontracting and underlying per diems going to more adequate reimbursement levels on, say, the average claim, have you seen any relief from some of the outlier provisions to get away from the extreme cost shifting that we've seen?

MR. DORAN: We are starting to see some structural changes in some of the contracts that are out there. It's definitely a network-by-network shift. It is also a local shift. I've seen some pretty well-known networks out there that are already restructuring contracts. They're doing it on a state-by-state level. They'll try and have one standard contract out there in a given state. I do believe it's coming, and it's happening right now. I just don't know how pervasive it will be in the future.

MR. SANFORD E. PENN: Mr. Collins mentioned the difficulty in getting fee schedule information from networks. I haven't worked on this in a number of years, but I seem to remember having the same problem where it would take quite a bit of time, maybe a few months, even to get the network to understand what we were asking for. Then some of them weren't even willing to do it. I was wondering if you had any tips that you could share as to how you get that information?

MR. COLLINS: Well, first of all, I'm happy to hear that I'm not alone in that struggle. Unfortunately, no, I don't have any tips that I've seen that are actually practical other than just pleasant persistence.

MR. ROBINSON: The one thing that we're doing is trying to make whatever survey and questions you put out there very simple. I've seen some surveys that are out there that have 12 pages, and it's just tough. Focus on what you need, what you're going to do with it, and make the question as simple possible. We've actually gotten some pretty good responses back fairly quickly. But again, we're trying to focus on inpatient hospital numbers, and you know we're asking three or four questions.

MR. DORAN: One thing that we're trying on a periodic basis, say, once a quarter, is loading a pretty defined set of claims into the repricing systems. We do this whether it's local or it's outsourced to try and track over time how the repricing is coming out. Then we can see how the charge levels are changing.

MR. DAVID OLSHO: Tim said that typical hospital payment structures are very disadvantageous for catastrophic claims. What we have found for 2001 with our roster of contributing companies for data is pretty much a level 13 percent trend assumption. We saw first-dollar coverage from the ground up, but we saw lower trends on the lower deductibles, under \$80,000, say, and higher above that. I guess the outlier has been increasing. The 13 percent first-dollar trend we were looking at was equivalent to 35–40 percent leverage trend increases. We saw that for 2001 it was actually worse than that. We're looking at claim costs rather than the frequency or the severity, but in prior studies it seems that the severity at any one deductible is relatively level. It's the frequency increases that are really driving the trend increases.

MR. ROBINSON: As you get more on the stop-loss side, you get more groups renewing that as their deductibles go up. That probably feeds into that too, I would think, because as the group goes from \$50,000 to \$75,000 to \$100,000, then you've got more volume and more lives at that higher level. You're going to see more claims at those levels anyway.

MR. DORAN: It would grow with the frequency, so it's claims per thousand covered.

MR. HUGH: I would just add that for the trends that we're projecting for 2003, we don't expect the underlying first-dollar trends to go up from the 2002 levels, but we do expect the leverage trends to go up from 2002.

Our next topic is case management/utilization review.

MR. DORAN: The way that we get notified of a potential catastrophic claim is through what we call the early claims notification process. We're literally giving our TPAs and carriers a list of diagnoses and a dollar trigger, for them to basically let us know when that potential catastrophic claim code gets hit and/or the potential dollar amount gets hit. Last year, we had about 11,000 early claims notifications. We have a clinical staff whose job is to sift through those claims and identify where a potential case manager might be of value. It is voluntary and is something that happens well for some TPAs and poorly for others.

We also have some reports that we use to focus on hard dollar savings. We actually do contract with some vendors to basically put case management in place. For every \$1 we spend in case management, we see a return of \$2–4. That's hard dollars only. We don't do any sort of length of stay or other soft dollar adjustments when we're putting these statistics together. That's literally the bill as it was submitted, and we got it reduced to a lower rate.

I want to go over the specialty programs that we do have in place. We contract with Strategic Health for both transplants and cancer network. In terms of rough volume, we saw about 300 people in 2001 go through the transplant program. Of

those 300 people, 160 notified us of potential transplant and went through the network. With the network there are savings, and there's care coordination that helps people through the medical system, since going through a transplant can be really very difficult.

In terms of the cancer program, that's part of the National Comprehensive Cancer Network, Centers of Excellence, and names of hospitals like Duke and Johns Hopkins. If anybody is going through any sort of cancer episode, I definitely recommend you go to their Web site, www.nccn.org. It is just an incredible place to learn about the appropriate treatment based on protocols and clinical protocols that actually have been developed and shared among all those hospitals. They actually update those on an annual basis using data from their patient database. So it's really a robust tool and great CD-ROM. Last year we had 125 people go through that network. Of the 125, six were found not to have cancer. That's a really nice value added that you can give to somebody.

In terms of neonatal referral program we work with a company called CareAssist with board-certified neonatologists and case managers who specialize in care for neonates. They have five years at a minimum of experience. It's worked out for us very nicely. We have about 50 infants a year going through that program as well.

We actually involve a case manager who will reprice the claims. There are many different facilities that we go through. We offer a bunch of different features with each of these programs. We also are just introducing a specialty pharmacy program. We're working with Advanced PCS and Bio-Scripts to look at a small portion of the drug spectrum. It's really those kinds of biotech drugs that are in the pipeline that are really high cost on a yearly basis. It could potentially cost up to \$300,000 in a given year for prescription drugs. Pricing really isn't the issue there. It's more how the drugs are administered. It is also important to consider how case management is involved in administering those drugs. We have an arrangement with Baxter to provide access to IVIG (intravenous immune globulin) because it is tough to get a reliable supply at a reasonable cost. Those are the kinds of the programs we use today to assist in case management.

MR. COLLINS: I'll continue by giving you an example of some more struggles that we're having and trying to work our way through. We're still dealing with the issue of trying to effectively measure the savings resulting from care management. And for some reason the executives and the program managers still want to see some numbers behind them, and the problems are classic. The medical aspect is so dynamic that it's hard to isolate a single component. It's impossible in some ways to measure what would have happened if the care management was not in place based on your particular book of business at the time, and it's hard to get enough pieces of accurate and statistically significant data.

The nature of our fee-for-service PPO business doesn't necessarily lend itself to really aggressive care management practices. The current environment has been

made a little bit easier than what I recall in past years, when there was seemingly constant pressure to lower premium rates, and more care management initiatives would be the solution as somewhat of an excuse to lower the rates. Today's environment seems to lend itself a little better toward considering a particular care management initiative that is value added. It also allows a retrospective look to see what the savings were on a historical basis.

We have a number of initiatives in place with our client companies that are really focusing on the blocking and tackling of the big three: cardiovascular, cancer and neonatal.

I'd like to share with you one of the interesting projects that we had undertaken that is part of our value improvement project. We had gotten together with a technology partner and one of our commercial HMO clients. Our goal was to determine whether you could implement some clinical base technology that could demonstrate a positive impact on medical outcomes on the members who were covered while at the same time improving some financial outcomes. The study took this commercial HMO. They picked 50,000 members, and they split them into two groups of 25,000 each. Those members were selected somewhat randomly, but there was some analysis done to ensure that with a combination of various factors they were essentially as equal as you can expect them to be in terms of age, sex, historical claim cost and so on.

The first 25,000 members were put into this program, and they didn't necessarily know that they were in it. A care engine was set up, and this care engine contained the latest evidence-based medical practices. Then we set up what they called a real-time claims data feed. I'll call it a near-real-time claims data feed. It's fed into this care engine. It's basically a combination of the hospital lab, pharmacy and provider, and it also includes some nursing information from notes. This care engine then compares from the claim data the medical practices that are actually being done with the latest evidence based on what best practices are. It then develops a care recommendation, which basically tells the physician or provider what is considered to be the best practice. It leaves it at that. It doesn't say to the physician that you must change, but it's more of an information tool. It's done both by a letter and by a telephone follow-up call. Unfortunately, the problems are numerous, and as an actuary, I guess I'm a natural skeptic. Actually implementing near-real-time claims data fees is always a challenge, and it was in this case.

How do we know that the care engine itself does contain adequate up-to-date practices? That's certainly a minor expertise. I think we satisfied ourselves well enough to do that. Will these physicians actually change their practice patterns, and will they even accept this type of an approach? Nonetheless, it was pressed on, and we basically have a 12-month report now. The results of this report are interesting. When you're comparing these two control groups, we had a 14 percent greater compliance with the evidenced-based medical practices. We had 7 percent fewer hospital admissions and admits per thousand. We had 11 percent fewer hospital

days and days per thousand. In the two groups, we had \$4.5 million less in charges for that group. There was also just under \$2 million less in actual claims.

The thing that I took away from my own experiences is that we defined quality as following along with these best practices. I saw something of a scientific study that actually showed me that following best practices actually does save some money in a commercial population. In many studies that I saw, they were targeting mostly Medicare HMO-type populations, or populations that really didn't apply to the business that we were working on. I found that interesting, particularly in light of the latest news article that I saw from the Midwest Business Group on health. That article stated that medical errors including unnecessary treatments, misused drugs and bureaucratic waste account for approximately 30 percent of medical expenditures. That seemed to me that there is some potential here in actually improving quality of care or compliance with best practices and actually saving money.

MR. DEAN TAYLOR: I have three questions dealing with the timing and the early notification of high dollar claims from the insured to the reinsured. Do you find that there are different claim thresholds for different diagnoses that are typically used? If they're the same, are they changing over time? Are they coming down to show that a case manager's intervention might be more efficacious the faster they get to it?

MR. DORAN: What we generally have in place is an overall threshold. It's generally around \$25,000 in paid claims. Other than that, regardless of the actual claim level, what we generally have in place is a specific list of diagnosis codes that trigger notifications. The idea is that for these specific codes they're notified regardless of the level so that you can get into those as early as possible.

MR. COLLINS: We don't have different thresholds for different diagnoses at this point in time. We are looking at that though. We're actually doing a study right now to see, given that we have 11,000 in a given year to pour through, how we can systematically minimize that number and maximize the effort. We're actually going through that exact analysis that you mentioned. We are looking back at ourselves to try and pare down a diagnosis level.

MR. ROBINSON: To follow up on what you just said in terms of real identification, that really is one of the things that you hear the most focus on right now. It does need to vary to the extent that we can implement things by diagnosis type because the issues are so different. For example, with neonates, if it's an employer stop-loss case, there may be so many different parties involved that by the time the risk taker actually finds out, the baby may have been in the hospital for a long period of time and may be an expensive case. The baby may already be home. A transplant is different in that you can know about the case well in advance, maybe a year or more in advance of when it actually takes place. With some of the chronic conditions, that may be more of an ongoing thing where you'll know through risk

assessment. It's a matter then of figuring out who's going to be in the population the following year, and whether or not they're going to be a risk to you. The issues really are different, I think, by diagnosis types. That's a good thing to consider.

MR. HUGH: Next we'll move on to prediction models.

MR. ROBINSON: We weren't intending to talk much about risk assessment models as they apply to the more chronic lower-level specialty care and that type of thing. We just wanted to point out that usually what you see is the intention. The best ability of those types of models is for when you're using demographics, prescription drug data, certain diagnoses and procedure codes. Most of the success that you have is in predicting chronic conditions; you might call it chronic disease burden or chronic cost per subsequent time periods. Depending on what specific types of claims you're interested in, even those types of models that do relatively well with chronic conditions aren't going to be able to predict some of the higher-cost events that are more random in nature. Transplants, neonates and things like traumas are probably the best examples of lower predictability. You may be able to predict those events based on the things you typically see in claims data, with a little bit better or worse accuracy depending on what type of demographic data you have.

For catastrophic claims, I'm thinking of things like neonates, transplants, traumas and some of the rare types of diseases that you may not be able to predict at all based on looking at somebody's claims history because there are no indicators of anything like that.

In general, it depends on the data that you have available, but it seems to make more sense to look at the demographic factors that are predictive when you're talking about those really high-end types of catastrophic cases, even if they have small predictive value of the likely catastrophic care costs. I'm thinking more of the frequency than the cost. It intuitively makes sense if you think about looking at things by disease state or by claim type, for instance, looking at transplants separately from neonates.

If your population is relatively older, that tells you one thing about the likelihood of changes and incident rates for some of the chronic conditions such as end stage renal disease, liver failure and things like that. That probably tells you something quite a bit different about the expected incident rates for transplants relative to another population just because of the nature of transplant frequency rates tending to plateau and then actually dropping off at the older ages. Similarly, with neonates, obviously the pattern is going to be a lot different if you're looking at a population that's relatively younger and has maybe relatively more females than males as other populations. My main point is that some of the variables that you might consider in doing projections that may be applicable to your primary care and your lower-level specialty care costs aren't necessarily as useful, if they're useful at all, on the catastrophic care site. It's an example of making the best use of what you have and really not relying on experience that may not have much, if any,

credibility when you get to the higher-end claims.

MR. DORAN: My experience with predictive modeling so far has been interesting, because I love to test new ways to try and help improve the process through technology. My story is a little bit one of disappointment as far as turning it into something that you can actually use in your particular health plan. The models that I've reviewed so far seem to be heavily based from either a clinical perspective or an actuarial perspective.

These models seem to work best with an isolated, clearly identified managed care population where the objective is to pick out the most likely candidates of this defined population for case management. The other initiatives that I've seen them used for just don't have enough confidence that they will actually predict the appropriate outcomes. If a model does meet these requirements, there is uncertainty as to whether the time, effort and expense involved in putting it in place is going to be better than the actual benefits that you're going to get out of the initiative.

MR. COLLINS: I'm cautiously optimistic—skeptical but optimistic. We've looked at a couple of the different tools that are out there, and to the extent that we don't have ready first-dollar data available to us, it's difficult for us to chug through a whole bunch of ICD-9 (International Classification of Diseases 9th Revision) clinical modification codes or diagnosis categories and actually get to that predictive power that's behind some of these engines to the extent that we could use them. In the future, they definitely could help set higher specific deductibles for certain individuals once we're going through our underwriting process. We're always on the lookout for tools that might help us identify high-cost chronic conditions. To the extent that these tools, as they evolve, get better at predicting those types of claimants, we'll definitely be looking at them in the future.

MR. JOHN DAWSON: You talked about your disappointment with the models that are out there in predicting catastrophic claims, and we've seen the same thing. I'm wondering if maybe we should be trying to do something different. We've seen some of these same models be adapted to do a really great job of predicting aggregate experience. That's what employers really want. They don't really care so much if they have one really big claim. They care more about whether it's not below their budget. I'd like to see us maybe look a little bit more at providing what the employers want and stop trying to do something that it sounds like we can't really do very well anyway.

MR. HUGH: Good point, and it's a matter of perspective. From the reinsurers' vantage point, Patrick and I must look at the individual catastrophic claims because that is where our primary exposure lies. From the employers' perspective, they're looking more at the aggregate claims because that's where their exposure lies.

Our next topic is the future drivers of costs.

MR. DOREN: When we're looking at the traditional drivers of large claims, I group them into categories of medical technology, care management, network contracting and demographics. As far as medical technologies, I think that we're trying to pay attention to gene-related or genomic therapies and what I'll call inventive new uses of old technologies. We have a specific example that we highlighted in the most recent addition of the Emory Healthcare newsletter that I found to be interesting. Current CT scans are able to do what they call a full body scan. I guess it goes from the neck to the pelvis in one millimeter slices in about 30 seconds. In and of themselves, they're not particularly costly. The concern is, particularly from our clinical folks, how will they be used, and what will the impact be both on the quality side and on the cost side?

A physician underwent this whole body scan as "an experiment" to see whether he thought it would be worthwhile. Other than revealing the things about himself that he already knew, the scan revealed a four centimeter kidney mass. The final verdict at the end of the day was that it was a perfectly benign cyst that had probably been there for years, and it would remain there for the rest of the physician's life. However, the diagnostic workups and all the tests involved to rule out the cancer took about a month and generated about \$25,000 in expenses. This is one example that I noted of what I call old technologies used in new ways. We need to not only consider what the implications of additional uses of these technologies are, but also the residual implications of using these technologies in terms of other types of claims. With regard to gene therapy, the shock for us was the speed of the mapping of the genome. It wasn't scheduled to be completed until 2005, but it is already almost done. We see approximately a dozen or so gene therapy companies that are touching virtually every disease and condition out there. That has the potential to seriously accelerate some of the gene-related treatments. Offsetting these are the fact that this isn't necessarily an easy process. Many of these diseases are multifactorial. We're just keeping an eye on that to see where it goes.

Touching briefly on demographics, obviously everybody knows that the population is aging. We're noticing that there are more people staying in the work force and reentering it at older ages. What we're paying attention to is the experience by age and gender bands and making sure that we're staying current in that arena. From our perspective, an active employer population doesn't necessarily have a lot of employee experience historically at the upper age level. We're trying to keep track of that to make sure that the age-sex factors and nonrating are reflective of what we feel is going to be the actual experience going forward.

On the network contracting side, we're noticing that the incidence rates for inpatient and outpatient are going up. We're trying to track that as best we can. We're putting an optimistic hat on and thinking that the increases in the rates that we are going through are probably going to stay somewhat static going forward in coming years. We are hoping that that's the case and trying to monitor them going forward.

In terms of impact for high-cost claimants in the future, neonates, solid organ transplants and hepatitis C are three of the top ones. I'd also add cancer. The treatment of cancer is going forward. Neonates are increasing in frequency. We're literally now seeing a significant number of premature infants at 23 weeks gestation. I think it's going to keep going down, which is good news for the health care industry. However, it gets expensive to take care of them.

In terms of solid organ transplants, both the demand and the technology, I think, are amazing. Organs need to be readily matched to people. I think that technology is going to help in allowing for greater potential matches in the future. Also, in this regard, the technology in terms of things like domino transplants, where you have three people engaged in a transplant. I think those kinds of surgical procedures are going to become more common in the future.

In terms of cancer, I think that the drug therapies are going to be the big driver there. There are biotech drugs out there that are costing tens of thousands of dollars a year that are specifically designed to assist in either red blood cell or white blood count. They are specifically designed to be engaged to assist you while you're going through chemotherapy. What was five years ago a terminal diagnosis, I think is now going to become more and more of a chronic illness. Cancer that once was terminal is going to become a chronic illness. You're going to be seeing people going through treatments for multiyear periods and with very expensive drug therapies that are going to be required.

MR. ROBINSON: I will consider another angle in thinking about the impact of population aging as far as demographic changes. Think about what's behind that in terms of what might drive cost and frequency rates to increase. It's another reason to want to develop your pricing and reserving models by disease state or by claim type, for example. That goes back to what we talked about with the predictive modeling where the impact of demographics is a lot different on catastrophic care cost versus first dollar cost, for example. By applying the current population to the Census Bureau's 2010 projection by age and by sex, I came up with some percentages. The main point is that it seems like it's important to go into the details of how the aging population and different demographic changes are going to affect different types of claims, different types of diseases rather than doing just an overall blanket review. How is it going to look as far as claim cost in general?

MR. COLLINS: The epidemic laws model that we reviewed had predicted a 68 percent increase in liver cancer. I think this probably ties in a little bit with what we've already seen. Liver cancer is one of the cancer types that was actually increasing the most in the under 65 population over the last several years.

There was potential for a 500 percent increase in demand for liver transplants just over the next six years or so. With donor availability in terms of doing split liver transplants and other things like that, there are many things that can be done. The potential could be huge. Liver transplants on average are the most expensive of the

solid organ transplant types. The cost impact potentially could be huge.

Drug-resistant streptococcus pneumonia has been increasing in incidents over probably the last 15 years or so. Unfortunately I don't really have any cost data that I could find. Anecdotally these are often the kinds of cases that you'll see where somebody just shows up. They're violently sick, and they run up a \$1 million case, maybe a \$2 million case before they maybe do not survive.

There are also new applications of tissue transplants. If you think about the last couple of years, a lot of the discussion with respect to tissue transplants has been around the effectiveness or maybe ineffectiveness of bone marrow transplants with respect to treating breast cancer and other types of solid tumor malignancies. We're looking at historical data to see how many tissue transplants were done, and we're trying to use that as a basis for projecting how many there might be. In coming periods, it's probably going to be more useful to look at things like what are the disease patterns for other uses of tissue transplants that may be in discussion. I know we've seen some information lately about using tissue transplants as treatments for Parkinson's, multiple sclerosis and things like that. Maybe we need to start looking at the incidence rates of some disease types like those in order to consider what that's going to mean for transplant frequencies going forward.

MR. CRISPIN: Do you have any thoughts on general medical trends as opposed to, say, general medication trends for claims excess, \$100,000 or \$250,000?

MR. ROBINSON: Implicit in our assumptions are increasing trend levels and increasing deductibles. In terms of the overall claims themselves, are they going to be increasing at a greater rate? We have not made that study. If you're asking, "Are \$100,000 claims growing at a greater rate than, say, \$250,00 claims?" we haven't implicitly made that assumption. We have a base trend, and then we'll leverage it out for the deductible. But by cost and by diagnosis, we haven't gone down that road.

MR. DOREN: My comments will be more along the lines of, on a baseline trend basis, what we'll see 2001, or 2002 being slightly higher in weight than 2001. At least that is our expectation. We also see and expect, based on what we know, some type of either leveling or deceleration of that trend and the underlying sort of first dollar. Offsetting that fact with our book of business, in particular, is the fact that many of these plans are selecting less rich benefit plans. Specifically, you're focusing on the deductible. The deductibles are going up significantly, and it's going to add to the leverage. The leveraging affect is going to add to that in terms of what we're assuming in our premium rates.