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Session 24PD Contemporary Risk Appraisal

Track: Product Development

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Panelists: Richard L. Bergstrom
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Summary: Underwriting and risk assessment methods continue to evolve in the first part of the 21st century. Agents want quicker turnaround time and the best risk classes, companies are writing more business to the senior market and new tools have been identified to aid the underwriter in assessing risk more expediently. This session answers the following questions: What tools do underwriters now use for appraising risk in various markets? What is the impact of preferred exceptions and business decisions, both from a pricing and claims perspective? What are some of the new ideas for assessing risk at older ages?

MS. MARY BROESCH: We have a multidisciplinary panel here today to talk about some of these underwriting topics. We have an actuary, an underwriter and a medical director. Most of you doing product development know that those are the key professions needed to help you in analyzing mortality and doing underwriting. Each of our presenters will present an aspect of underwriting individual life risks in the current marketplace. One will focus on some of the risk appraisal tools, one will focus on business exceptions and one will focus on risk assessment at the older ages.

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Our first speaker is Rick Bergstrom. He's a consulting actuary with Milliman in Seattle, where he has worked for the past 20 years. His expertise includes determining the appropriate underwriting requirements for achieving mortality levels, quantifying protective value of various underwriting tests and requirements, and assessing life expectancies for impaired risk individuals. Rick is very active on a number of Society of Actuaries committees. He is vice chair of the Individual Life Experience Committee, as well as the vice chair of the Mortality and Underwriting Survey Committee. He's a frequent speaker at actuarial and underwriting meetings. Rick will discuss a number of fairly new tools used to evaluate individual risks.

MR. RICHARD L. BERGSTROM: About five, six or seven years ago, the Society in its wisdom eliminated most of the material on the syllabuses regarding underwriting and risk appraisal. For those of you who may not have had a chance to get too involved in that aspect, I thought that I would go through some elementary aspects of underwriting and then work toward more sophisticated aspects of it.

The full life underwriting process involves assessment of multiple mortality factors in the profile of the proposed applicant. These are the traditional factors that we all learn about in going through Underwriting 101: age, sex, height, weight, questions about current physical condition, applicant's medical history including drug and alcohol abuse, personal history relevant to the life insurability of the purchase and also questions about family medical history, which is becoming very important in the preferred risk underwriting areas. We also ask about occupation, foreign residence or travel, driving record, private aviation, hazardous avocations and, for those situations that involve more of a business insurance application, we do ask for financial information regarding insurable interest and the person's actual financials.

The tools used by the life underwriter in selecting risk—this is important—are chosen for their ability to provide *relevant* mortality information for one or more or many of those factors. One way we determine which set of tools we use is the cost of obtaining and handling the information. We also consider the relative benefit obtained by an underwriting tool. An underwriting requirement, no matter how inexpensive or easy to obtain, provides no value if it typically contains no information regarding mortality significance. That may sound obvious, but if for some reason all applicants who smoked admitted that they smoked, we wouldn't need to do a urinalysis test. All we would do is validate what they said they did. In that particular case, there would be no value in going ahead and doing that portion of the urine test.

The ease or availability and the speed with which the tool can be obtained are important. Speed is becoming very important because different distribution systems have different speed requirements. How fast can we get the policy issued? If speed is of no real concern, then at least the underwriter has the ability to look at more lengthy types of tools like the attending physician's statement (APS).

From where do we get our information in the selection process? The first person we get it from is the applicant himself. We do it through the questions that we ask him, inspection reports and things like that. The next source is the agent himself. If you do not know this, at the end of Part II of the application, there is an agent's report, wherein he or she is supposed to write down how he got to meet the applicant, what he knows about him and such things. That can become very important to an underwriter in trying to assess where this business came from in the first place.

Obviously there are medical sources, such as APSs, doctors, hospitals and clinics. An allowance to use these sources is signed by the applicant at the bottom of the application. The only way we can go out and look at personal history is with the applicant's permission.

There are other sources, including other insurance companies, through the Medical Information Bureau (MIB). Is everybody familiar with MIB? Were you aware that the MIB is the main number-crunching tool of the Society of Actuaries? They are the ones that crank all of our experience studies.

Other third-party sources would include an applicant's accountant. It could be the applicant's attorney. It could be personal references, friends or business associates. One of the newest tools is pharmaceutical databases. ScriptCheck, Ingenix and IntelRx are three of those with which I'm familiar. I'll talk a little more about those later.

The choice of underwriting tools is a decision that each company needs to make for itself. That decision is based upon the product type, the market and such things. Obviously each requirement has a cost and a benefit applicable to it. I'll talk about cost/benefit tools in a minute. Obviously all assumptions, all tools, impact both the mortality and the profitability that will eventually be recognized by the company. No particular tool or set of underwriting tools is appropriate in all circumstances. There is no one-size-fits-all set of tools for all companies.

Some techniques are gaining in popularity. The personal history interview (PHI) has been around for some time, but more and more companies in certain environments are using it. Essentially it's a telephone interview with the proposed applicant. It's usually conducted by someone in the home office, who may or may not be an underwriter (it could be someone else in the home office), or there are vendors that are subcontracted to perform the PHI. Some companies also refer to these as the "new business interview." It's a review of the application questions with the applicant to confirm the answers. They can confirm other selected medical information, such as tobacco usage or the name of the personal physician, if the applicant left that off. They can also obtain information if the application is incomplete. The applicant may have simply forgotten to sign something, either on purpose or otherwise. The PHI is almost always conducted directly with the insured, not the insured's spouse or relative.

Another tool is teleunderwriting. There are different words for this, such as teleapp. They are different things. A teleunderwriting interview is more comprehensive than the teleapp process, which essentially just asks the questions on Part II of the application. The teleunderwriting does involve completion of the full Part II. As with the PHI, if certain questions are answered in a certain way, the underwriter is prompted by a drop-down box to ask additional "drill-down" questions on that condition. For example, if you're a diabetic, a screen will pop up to ask additional questions about diabetes. This process allows the more advanced underwriters to assess the more complex cases and doesn't limit them to spending time on the telephone with the applicant. The teleunderwriting person may also have the authority to set up paramedical (paramed) exams or even full medicals.

As I said, this process can be internalized with companies. I've seen that done very well. It can also be outsourced. There are a number of companies that do use vendors for outsourcing underwriting. The main reason they do it is that it allows them to control their costs because you pay as you go, there's no overhead there and they often will place a limitation on the amount that the outsource vendor is able to underwrite, say \$1 million or \$2 million. The basic benefit of teleunderwriting is to reduce cycle times (get the policy issued as soon as possible) and, in some companies, it eliminates the need for "routine" APSs.

Let's talk about pharmaceutical databases. Pharmacies, at least the major chains, all belong to a pharmaceutical database manager service, called a pharmacy benefit manager (PBM). PBMs compile records of prescriptions written through the pharmacy. By doing so, PBMs work with the drug companies in monitoring the usage of certain prescriptions. The information given back from a PBM inquiry includes the prescribing doctor's name, the person receiving the medication, what the dosage is and how long the person has been on it. This is a lot of information.

The content can be used to validate the application information. If your application asks, "Are you on prescription medications?" it can validate that. If the application doesn't ask the question, it can uncover any nondisclosed information regarding prescription drug usage. There are limitations here. Not all the pharmacies are members of a PBM, and not all PBMs allow usage of their database information for insurance purposes. Unfortunately, little information, if any, is contained on applicants over age 65 on Medicare.

Another tool that's being used more and more is agent-collected oral fluid. It is more than spit. It is actually a specimen taken from your mouth. It's called mucosaltransudate. I've been told that it is closer to something like clear blood than it is to saliva. It's currently used for HIV-antibody testing, cocaine usage and cotinine. Cotinine is the metabolite of nicotine, which shows whether a person has smoked or has been around tobacco in the last 72 hours. The kit device looks like a toothbrush. You place it between your teeth and your gum for about two to four minutes, and then when you're done, it's sealed and sent off to a lab for analysis.

The main advantage of this is that it can be collected by an agent. There's no need to have a paramed or the expense of a paramed to collect this. Some of the studies I've done show that this type of testing has real protective value down to some very small amounts of insurance. It's most cost-effective at amounts under \$150,000 and for applicants under the age of 45. The total cost for the kit is between \$15 and \$20, depending on volume.

There's something new out. It's not used in the life insurance market yet, but I've seen it. This is called "skin cholesterol" or "skin sterol." In the blood test we take, one of the markers we look at for coronary artery disease (CAD), is your lipid levels, your cholesterol and your HDL. Your HDL is your "good" cholesterol. This new tool does not do exactly that, but it looks at a different form of cholesterol called sterol. Currently, the company has it in clinical trials. They're validating it with the Framingham population. One of the real advantages is that it can be agent collected. It's a cloth that's rubbed in the palm of your hand, then sealed and sent off for testing. Early studies show that with this there is some very positive correlation with stress tests, with predicting blood vessels with a greater than 50 percent stenosis (which means how clogged your arteries are, essentially) and with C-reactive protein (CRP), which is a nonspecific but an otherwise good marker for potential coronary artery disease.

The next tool is something that I've been involved with for many years now, which is developing protective value studies on various types of tests. It's essentially a cost/benefit analysis. It helps companies determine where to set their testing thresholds for the various types of tests they're considering. The obvious testing we can do on blood serum, oral fluid, urine and those types of lab tests, but it can, frankly, be used for anything that you can quantify that has a value of some sort, such as an APS. What it attempts to do is answer this very specific question: Is the cost of tests or testing more or less than the benefits to be derived from the tests? In other words, is savings greater than cost, where the cost is essentially any costs associated with the test, direct costs or otherwise, including kit costs, paramedical collection costs, handling charges and lab analysis. Those are the hard-dollar costs. Often companies will want to put in some soft-dollar costs just for their own underwriting team to evaluate the results. The savings is the present value of future excess mortality that would otherwise flow through in the absence of a test. So, if you did not test for smoking, and yet many applicants lie about their smoking habits, there would be some excess mortality flowing through. What we're trying to do is quantify what that excess mortality is over some period of time.

In a very simplified formula, the savings is equal to, in my words, R times S times T times EPVBD. These are all components to evaluate the savings. R is the prevalence of the impairment you're looking for. For example, how many people smoke? Prevalence could be 20 percent. S is the sensitivity—how good the test is in identifying this specific impairment. T is the attribution ratio (or the exclusivity factor). This is a very important one because it's an estimate of how often the test might be the only way to find out if someone has a certain impairment. The values

of R, S and T are between 0 and 1. The EPVBD is the excess mortality of the impairment itself; it's the difference between the present value of total mortality with the impairment versus "standard" mortality without the impairment.

You need assumptions in calculating that specific formula. You need some kind of standard mortality table (usually your pricing table), a discount rate because there is a time value of money, lapse rates because people will lapse, the table rating for your impairment and then some kind of duration for the study. I typically use 20 years when I do mine. When the values of cost and savings have been tabulated, then a theoretical break-even threshold, which is the point at which it becomes cost effective to test, is computed by simply dividing the savings per \$1,000 into the cost of the tests.

One other thing that I try to include in coming up with a realized value of savings is the sentinel effect. The sentinel effect attempts to gauge the percentage of impaired applicants that simply do not apply for insurance because they know or are aware that the test would uncover the impairment for the underwriter. What they may do is apply for an amount of coverage that's less than the testing threshold or simply go to a different company entirely. Sentinel effect should be estimated before finalizing the savings value when appropriate. The value of the sentinel effect can range between no value, which is 100 percent mortality, and 400 percent or even higher. The value of the sentinel effect with testing for AIDS is probably 10 times as high as that, but the percentage of people who have AIDS is very small. In effect what we're doing with the sentinel effect is adjusting the value of the prevalence rate, R. In other words, there is value in the conscious deterrence of substandard applicants as they are not routinely issued standard risk policies. That's the point.

Finally, I want to talk about some preferred risk requirements. Does anybody not write preferred risk in this room? Anybody want to admit not writing preferred risk? Nobody wants to. Okay. These are the main questions that are answered that help an underwriter classify an applicant into which class he or she belongs. The questions are on tobacco usage (or, alternatively, how long you've not used tobacco—one year, three years, five years, never) and the different lipid thresholds (for your cholesterol as well as your HDL). Obviously blood pressure is an important criterion. Build is important. A history of alcohol and drug use, a personal history of cancer or coronary artery disease or diabetes (those types of impairments) and a family history of cancer and CAD are all important. It's essentially a genetic question; there is a strong correlation between individuals whose parents have had either coronary artery disease problems or cancer in the past. Obviously, we ask questions about hazardous avocations and extreme sports. The last questions may not be used to classify a person into a different risk class, but could be used, for example, to offer to a super preferred risk if they include the appropriate table rating or add on the cost per \$1,000 flat extra.

This is what I see happening in the industry. When I'm asked to evaluate a company's underwriting criteria, there are certain of those eight or nine questions I just reviewed that I count as knockout questions. Sometimes companies will allow one or more questions to be fudged. In other words, there's a decision made to go ahead and classify a person in a certain risk class even though he or she didn't fit all the criteria. There are questions you do not want to fudge on. If someone says he or she quit using tobacco three years ago, and the limit was five years ago to reach a certain classification, don't fudge on that. The excess mortality for the tobacco use can be very high. That one question alone should keep a person classified exactly where the rest of the criteria would place that person.

It's the same with the alcohol and drug abuse. The recidivism rate can be very high, even many years out. A personal history of cancer and coronary artery disease would probably be okay with a fairly long lead time, at least 10 years. Twenty years is better. Diabetes is not something we can fix. It can be controlled, but there are long-term effects on the kidney. Someone with a diabetic positive needs to get classified where that person should get classified, not given an allowance because diabetes is the only thing wrong with that person. As far as hazardous avocations and extreme sports, I've seen companies limit this to a time frame, say three years, with the understanding that if someone hasn't gone rock climbing in three years, he or she is probably not going to go rock climbing in the near future. I'd just as soon go ahead and add a flat extra on it and give that person whatever class for which that person would otherwise qualify.

Questions that have some latitude in them are questions relating to cholesterol, blood pressure and build. In other words, I think you can allow some margins here. If your cholesterol is only 10 points over the limit—your risk class says that 210 is the top that we'll take, but it's 220—but everything else works, I think that you've got some margin there to do that. It's the same with your ratio. If your threshold limit is 4.5 but the person is at 5.0, and that's the only thing that's wrong that would not put them in that classification, I'd fudge on that one. As far as blood pressure, I'd go plus points, either systolic or diastolic. If your limit is 135 for systolic, I'd go to 140 if there were no other risk factors. With diastolic, if your limit was 80, I'd go to 85 if there was nothing else that would otherwise classify you there. I'd give you five pounds on build, again, if there are no other, in this particular case, coronary markers. In other words, you cannot combine blood pressure and build and say, "Okay, we'll go ahead and give them." You don't give them two, not those two.

I have some suggestions. Other than those individual ones that I just discussed, I suggest that if there are two or more latitude overages, above the thresholds, I'd put them in the next class. If there are three of these that are borderline requirements, I'd say you should go to the next class as well. You're trying to underwrite to the middle of the class, not to the limits of the class. If you get three out at the limits, then you're really closer to the next risk class than the middle of this class. The idea behind all of this is that we are trying to meet the expectations

for that class. The underwriter needs to be able to classify an appropriate number of candidates into the right class. I don't know how many times I've talked to companies who are trying to qualify 30 percent in their best preferred risk class, and they get 60 percent. You start looking into that, and there are all sorts of these borderline things. The mortality is not going to work out at double what they expected because of the mortality they put in there by allowing these exceptions into that risk class.

MS. BROESCH: Our second speaker is Sharon Smith, the underwriter on our panel today. She is an assistant vice president of underwriting and claims at Canada Life Re. Until about five years ago she worked in underwriting on the direct side, so she has been in reinsurance for the past five years. She's also very active in the insurance industry. She's currently executive vice president of the Association of Home Office Underwriters and serves on the MIB's Risk Assessment and Project Development Advisory Board. In the past she's held other positions, including chair of the Canadian Institute of Underwriters, president of the Toronto Underwriters' Association and Canadian coordinator for the Life Underwriting Education Committee.

MS. SHARON SMITH: Clearly we're not going to breach any antitrust laws today, and Canada Life's legal counsel would like to also make you aware that the opinions I'm going to express today are mine and may or may not reflect those of Canada Life Re.

I have been in the industry for 24 years. I have seen a lot of changes, both in the underwriting side of the house as well as the actuarial side. We have two other fine speakers on the panel today that are going to talk to you or already have talked to you about the new screening tools that we have and the whole preferred marketplace, but fundamentally, underwriting today is pretty much the same as it was 20 years ago. What has changed quite significantly in the last 20 years is the evolution of new risk management controls, which is where I'm going to focus. But before we go there, I'm going to bring you back to 20 years ago when I actually started underwriting.

Twenty years ago, we rated bartenders \$3 per \$1,000. Treated hypertension was rated. The Framingham Study wasn't out yet. We did urine testing. We had career distribution channels. We had aggregate rates. It was pretty easy with male/female, smoker/nonsmoker rates. We didn't issue beyond age 70. The relationship between direct companies and reinsurers was very kind, gentle, great and long-standing. We were excess of retention, and we had all the capacity we needed.

Today is just a little different. Treated blood pressure can now be preferred at some companies. We now do blood testing instead of just urine. We have all kinds of wonderful new markers, like alcohol and hepatitis markers, prostate-specific antigen (PSA) screening, etc. We're now well into the brokerage distribution

channels, and we've all seen the pressures that come to bear from the brokerage distribution channels. We have preferred products. We have table shave programs. Maximum issue age is 90. We're first dollar quota share. We have significant problems with capacity today, especially coming forward into 2005.

The primary impact of all of those changes is that the reinsurers now own 80 percent to 90 percent of the risk. The expectations of reinsurers are set at the time of the quote. I'll talk a little about what we do at Canada Life Re, and I'm sure it's not too different from other reinsurers. When we are reviewing a new business quote, we ask the underwriting department for your preferred classifications. We also have one of our underwriting managers do an interview with the chief underwriter at the direct company, and we ask you for your internal exception guidelines as well, because we know you have preferred criteria which are published to your field, but in most cases we also have internal criteria that the underwriters use. That's what we're looking for. We also look for the various distribution patterns, whether it be by age, by face amount or by preferred class. Our actuaries, of course, do the pricing accordingly, on the basis of what you're projecting.

When we come out then to audit your underwriting team, and when our actuaries look back at your experience, we want to see if what you said at time of pricing is what is actually going on in your shop. The audits that are done today are very different from what was done 20 years ago. They're done more often. These are much larger audits. We at Canada Life look at over 200 cases, and our audits are very targeted. We make sure we have a certain percentage of older ages and a certain percentage of larger face amounts. We make sure that we look at at least 100 of your preferred cases so that we can see your preferred exception rate. It's very different from audits done a number of years ago. We also are very honest with our findings. Preferred exceptions and other disagreements are reported. As I mentioned, our actuaries do look back and review their distribution patterns against what you said at time of quote. Of course, the big thing here is that if actual was not as expected, then you may see a pricing adjustment. It's important to know what's going on in your underwriting shop because it could very well impact the prices you're getting from reinsurers.

I'm going to talk for a few minutes about preferred exceptions, which is one of the hot topics of the day. There are a couple of questions I am asked most often by both chief underwriters and actuaries as we travel and audit companies. I'm going to start with: Why are exceptions made? There are a few people who like to say that it's the underwriters. The underwriters are doing it. It's 90/10, they don't care and they're just pushing everything through to the reinsurers. I'm an underwriter. I get defensive and say no, that's not what I see going on; there are some other issues. In my view, after having personally conducted 24 audits of direct companies, it's sales pressure. The number one cause of exceptions is sales pressure.

I'm sure you've all seen, maybe in your own companies—I know I've seen it time and time again, it doesn't matter at what direct company I am—on the underwriting worksheet a little note: "This is our top producer. Needs the case to win. Brought a big group case, 5,000 lives, \$17 million of premium. We need to give this guy preferred best." A lot of companies will stand behind the underwriting department and say, "No. You're going to get the proper risk assessment." Quite a number of other companies will actually set up appeal processes within their own departments so that the fields can debate the decision made and get some overturned. It's an interesting phenomenon today, and I think that's in large part due to the brokerage environment in which we work. Everybody is hungry for sales. We're all competing to get them on our books. We're trying to get those big managing general agents (MGAs) and those big brokers to do business with us. That is what we see time and time again on audit.

The second question I hear most often is: What percentage is okay? That is an interesting question. I hear a lot of people saying that less than 5 percent makes sense. I suppose intuitively you're going to want a small number because you know that if you misprice a large percentage of your block, you're not going to have the mortality experience that you think you're going to have. So, obviously you know it's going to be a very small percentage. My answer, though, is somewhat different. My answer is that it depends on how we priced. If we ask you during the pricing process, "What percentage of exceptions do you make?" and you say "None," then that's what I expect to find when I audit. If during the pricing process you say that you make 10 percent, then that's what I expect to find during the audit, and that's how we priced your block. I don't think a lot of these discussions about what the acceptable number of exceptions are necessary. It's how it was priced that is important.

What I also find interesting about preferred exceptions is that very few companies actually know their exception rate. It's very hard to get systems time to program all of your systems to make sure that we can track and report on all of this, but if you don't know what's going on in the underwriting department and if you don't know what percentage of your cases are going through on exceptions, then I'm not quite sure you know how to price it.

As I've mentioned, we've done 28 audits at Canada Life in the last three years maybe, and I've been involved in 24 of those personally. I'm going to share some observations with you. The exception rate that we have seen has ranged from 1 percent to 14 percent, not too different from some of the other reinsurers who are doing audits. Swiss Re's average from 2002 and 2003 was 6.8 percent. We're all kind of in that area. I'll tell you the difference between these two companies, though.

The president of that company at 1 percent is an underwriter. He stands behind his underwriting department. When his sales department comes to complain, he says,

"Well, go away and place the case somewhere else. If you can get the offer you need somewhere else, that's okay, place the case with them."

The company at the other end, at 14 percent, was equally interesting. They had been audited a month before I went in there with our team and weren't told anything. Everything was fine. The chief underwriter in the Monday morning opening meeting said, "We don't make exceptions here. Don't worry, Sharon." Clearly they were. He had no idea. He had had an audit from another reinsurer one month prior who found nothing. I'm not going to comment any further on that.

We also look at other disagreements. Once you get beyond the preferred cases, then you're looking at all the standard cases, and you're looking at the substandard cases to see if you agree with the final mortality assessments. Our disagreements ranged from 3 percent to 13 percent. I'll tell you that when we audit, we don't care about a one-table difference. We generally don't care about two unless it's on a 70-year-old for \$15 million or some of the more significant cases. We're talking serious disagreements in decisions here. Declines to standard and four-table differences mean a lot to my bottom line and yours as well.

The interesting thing about these two sets of statistics is that the company that had the 14 percent exception rate also had the 13 percent disagreement. Shortly after I came back from that visit, they had a new price from Canada Life. Coincidentally, at the time we were auditing, they were out re-quoting. Our price that our actuaries came back with was way worse than anybody else's price. The chief actuary asked our actuary, "What's going on? Why are you so lousy here?" The chief actuary hadn't seen the audit report. He had no idea what level of exceptions was being made in the underwriting department. Another clear observation is that very few companies tracked exception rate, and then they're sometimes side-blinded with information coming from their reinsurers.

Jumbo limits that are not clearly defined is another interesting finding. The jumbo limit definition in most treaties will say something to the effect that it's \$25 million to include everything in-force and everything applied. It doesn't matter if you're going to replace it or not. It says everything in force. That means if you're going to replace it, you better be adding it in or you're going to be exceeding your jumbo limit definitions under your treaty. That's fairly significant. Say, for example, you have a \$25 million jumbo limit and you're replacing \$25 million with another \$25 million. Your underwriter doesn't know and just sees "jumbo limit \$25 million," and they go ahead and auto bind the pool. You get a claim. Who do you think is holding that risk?

Determining jumbo limits today is a challenge. The brokerage world knows everybody's retention. They know your auto bind. They know your reinsurers. They're very sophisticated, and they play the marketplace. It's hard sometimes for underwriters to know which application is where and that what the agent says is

going to place will place. It is a challenge. From my perspective, financial underwriting is weak.

Treaty management is another area that we've seen a lot of focus on in the last year. Below is the sort of chart that I get presented with most often.

Treaty Management

Autobind: \$15 million

Jumbo Limit: \$25 million

| | A | B | C | D | E |
|----------------|----------|----------|----------|----------|----------|
| Term | 40% | 20% | 15% | 15% | 10% |
| Universal Life | 50% | | 25% | 25% | |

This is what I see most often. In my direct days, this is what we got. I can tell you that after 20 years on the direct side, I never saw a treaty. Not once. But if an underwriter has this, and he or she doesn't really understand that the jumbo limit is \$25 million and that you'd better be adding replacements, you could find yourself holding a lot of claims that you might not otherwise want to be holding. You could find yourself in an interesting situation explaining to management why you have to pay a \$25 million claim.

There's a lot more attention paid to treaties today. They've gone from a loose agreement that generally covered what the treaty said to tight contracts. We see the jumbo amount in the definition being made much more clear so that everybody fully understands what the definition is and who holds the risk if you don't meet that definition. We are now seeing companies including preferred guidelines in treaties. When we price your products, the preferred guidelines are an essential component to the pricing. It's not just underwriting. They are fundamental to the pricing process. Why you *wouldn't* include it in a treaty, I'll never know. When we include some other things (like the form that you're going to send off your claims on or your facultative underwriting form), why wouldn't you include your preferred guidelines, so that it's very clear, not only to us today but to those in 10 and 15 years having to adjudicate claims against these treaties? To me it just makes sense.

Looking forward, I can see a continued refinement of underwriting tools. We'll see more of that. We'll see a lot more focus on older-age underwriting, and, in fact, in a few minutes we're going to be focused on older-age underwriting. I think we'll see a lot of companies that will start to look at the pricing in the older ages. I know a couple of reinsurers have looked at their pricing this year and have not been satisfied with the results. These people are dying faster than I think some of our tables suggest they should be. I guess they didn't know about the actuarial tables.

Table shave programs are being revisited. We've seen that a fair bit already. We've seen people who have table shaves on term policies start to cancel them and have

them only on universal life (UL). People are starting to look at the table shaves that they have and ask if they should be available to age 80. Do you really want to be waiving three and four tables at age 80? Is that a sound business practice? I don't think so.

Then there is treaty wording. Probably many of you have been involved in treaty negotiations with reinsurers, and you see the increased emphasis on that. Over-retention is an issue. In-force reporting is a huge issue as well today. Many direct companies don't have their in-force databases up to date. Many of them aren't passing through to the reinsurers in a timely manner. The reinsurers, in turn, are not passing them through to the retros in a timely manner. Because of that, we have some major over-retention issues going on in the industry, and we have huge reductions coming to our jumbo limits on January 1, 2005.

We have different tools for underwriting today, and we have more slots in which to put the person. That is a big change. We have seen a whole new evolution of underwriting controls. We are seeing some companies now start to put tools into place in their system so that they can monitor the level of preferred exceptions, and we as a reinsurer are now starting to see reports come out of these direct companies. These companies would have come to us during pricing and said, "We're going to make 5 percent exceptions on this particular plan. We're going to track them and we're going to report to you regularly." That reporting could be quarterly, semi-annually or however often. That is what I would urge all of you to do. If you aren't tracking your preferred exceptions, how do you know what's going on? It's not easy. I know that it takes time to program systems, but I think it's something that has to be looked at.

We also have to make sure that treaty terms are communicated well, understood and followed, both on the underwriting side and on the claim side. Very few people see and actually read the treaties. These are the people responsible for making sure that they're following the treaties and putting the business on the books in the manner in which you agreed. If you're not giving out copies of the treaties to the underwriters and the claims people, then how do you expect them to put the controls in place you need to make sure that they're not going outside of the treaties and you find yourself maybe holding a claim that you otherwise thought you might not have?

Monitoring actual distribution and the mortality of business against expected is something we're seeing a lot more of in the last few years. We'll certainly see a lot more of it in the next few years. From my perspective, we're coming up against more and more controls in the underwriting area, just to make sure, again, that what you said to your reinsurers when you sold them 90 percent of your block is what, indeed, is going on in your house.

MS. BROESCH: Our last speaker for today is Dr. Tom Ashley, vice president and chief medical director at Gen Re LifeHealth. He oversees the medical operations of

the individual life division there. His responsibilities include maintaining and updating the underwriting manuals source and the training of the underwriters, as well as research and development. He currently serves as chair of the American Academy of Insurance's Medicine, Mortality and Morbidity Committee. Tom is a member of the MIB Morbidity and Mortality Liaison Committee. He's also on the ACLI Medical Risk Classification Issues Committee and the ACLI Medical Section Program Committee for 2005. He has also been involved in some of the SOA committees, including the Mortality Studies Working Group. Tom joined Gen Re in 2000 and has had 16 years of insurance medicine experience. Prior to that, he had his own clinical practice of internal medicine. He is board-certified in internal medicine, geriatric medicine and insurance medicine.

DR. THOMAS ASHLEY: I want to talk to you today about something that has occupied a lot of my time in research and development at Gen Re LifeHealth, and that's risk assessment in the elderly. We've been told that that's a major problem. We get it in a formal setting at our annual client advisory council meeting, where our clients tell us that this a problem. I get it in my official duties when underwriters bring me cases of elderly applicants and in my own personal experience. These cases are different and significantly harder to underwrite.

As I started thinking about how to address that problem, I realized that "the elderly are different" is the core of geriatric medicine. This is a distinct discipline. Taking care of old people and thinking about medical problems in old people is not the same. It's also true in underwriting. I tried to approach that by looking at the processes that we use that we're comfortable with when looking at younger risks and then thinking about how poorly they extend when we try to look at elderly risks. Conventional underwriting, as Sharon says, hasn't changed very much in the last 20 years. There's a generally homogeneous, healthy population of people. There are a few people that have a problem in that population. The task of the underwriter is to find that minority that has problems.

Another premise is that we have developed tools to find that minority—the tools that Rick talked about and that we're still using—and that those tools succeed in finding the people that matter to making the underwriting decision. The third premise is the key thing that comes out of geriatric medicine—mortality risk corresponds to medical diagnosis. That works in younger people very well. The last thing is that we can use cardiovascular risk factors in a defined way, even among the apparently healthy people, to sort out the risks. None of those things work very well in the elderly, and I want to spend some time showing you exactly how they don't work very well and then what we might do differently.

It's obvious to everybody who has been around old people that old people have diseases. Old people use prescription medications at twice the rate of younger people. If you ask people for a self-assessment of their health, two-thirds of young people say that they're in good or excellent health, and it's only half that by the time you get to age 80.

I'm going to spend a lot of time in this presentation talking about cognitive function and dementia because that's a crucial difference in the elderly. How common is disease in the elderly? Cognitive dysfunction alone shows that disease is not rare in the elderly. If you go into the community and do formal cognitive function testing on people who are living independently, about 10 percent of all people in the United States above age 65 are going to show some significant cognitive dysfunction. By the time you're at age 85 and up, it's up to 40 percent. That's only part of the problem, because dementia is the advanced stage of a condition that we refer to as "mild cognitive impairment (MCI)." In addition to the people with dementia, about 15 percent of the population above age 75 have mild cognitive impairment. The significance of that is that a population of MCI patients will progress to dementia at a rate better than one in 10 every year.

Now I'll talk about whether medical records detect impairment and a study that shows how far wrong it is. We think that for younger people, we're comfortable with our experience that we are finding the disease that matters to us with the tools that we have. Let's look at cognitive function. In a study that came from a large ambulatory medical care practice, the researchers measured cognitive function in a formal, objective way for everybody who visited that practice over a period of time. They also asked the clinician who saw the patient to give a judgment of the cognitive function of the patient that was just seen. Then they looked at the medical record to see what it showed about cognitive function. This study found that in people with mild dementia, in four out of five cases the doctor either misjudged it and said that cognitive function was normal or, even if the doctor got it right, there was no trace of that judgment anywhere in the medical record. We physicians do a little better as dementia gets more severe, but even when you get to a stage of severe dementia, one in five cases is either missed in the diagnosis or neglected in the medical record. Overall, about two out of three cases of dementia are completely invisible to your underwriters, using the tools that we conventionally use. As I'm going to show you later, that has a big effect on mortality. It's not something that we can afford to overlook, and we have to assume that we are seriously overlooking cognitive dysfunction.

The geriatric literature is full of the lesson from the Cardiovascular Health Study. It gets at this premise that when we underwrite, our goal is to find the diseases. From there, we can convert to a mortality assessment based on the knowledge of the disease and the severity of the disease. The Cardiovascular Health Study used a community population able to live independently, above age 70 at the time of enrollment in the study, and followed them for over five years. This particular publication showed five-year mortality results and the enrollment parameters that predicted that mortality. The top mortality predictor in the Cardiovascular Health Study was cognitive function. That was the most powerful predictor of mortality at five years. Physical activity, which is sometimes measured and discussed in the form of frailty in the elderly, was the second-most important predictor. Some of the things that we look at in underwriting still work in the elderly. Build still matters, but in the elderly it's much more important to find people who are underweight.

The bigger mortality risk is there. Being overweight when you're over age 70 is much less of a risk than it is when you're younger.

One of the blood tests that has become more and more common is very effective in risk assessment in the elderly. That's the serum albumin. We've just developed an underwriting knowledge test that we've piloted for the first time on our own underwriters. One of the questions related to a report from the lab on the serum albumin level. The geriatric literature is very convincing that above age 70 albumin less than 4.2 means some increased mortality, and albumin below 3.7 means seriously increased mortality. However, if you go into your underwriting shop and see what the laboratory is reporting to your risk assessors, it's going to show that a normal range for that test that goes at least down to 3.5, and a lot of labs are reporting normal albumin down to 3.0. So when the underwriter sees a lab report with an albumin of 3.2 in our test of an 85-year-old applicant, almost every one of our underwriters passes that off as acceptable because the lab doesn't flag it as an abnormal value.

The most surprising lesson from the Cardiovascular Health Study is related to the connection between diagnosis and mortality risk. The methodology of this study was a familiar one with multivariate analysis and then going back to find the independent predictors of mortality. You look at all the things in the Cardiovascular Health Study that prove independent as predictors of mortality, then in the model look at specifically whether there was a history of coronary artery disease and then add that to the model. Did this person have a previous heart attack? Does the person have angina? Has there been an angioplasty or bypass surgery? Once you account for the independent predictors, that history no longer contributes to the mortality assessment. The knowledge of the list of diagnoses that we depend upon when we underwrite doesn't carry over well when we're looking at elderly applicants. The lesson here is that you need to look at multiple factors in assessing elderly mortality risk. You need objective, quantitative measures of disease rather than a clinical history of disease.

The cardiovascular risk factors behave differently in the elderly. One of our actuaries did a study for us that looked at the 20-year mortality of smokers versus nonsmokers from the 2001 CSO-VBT. Typically, products are priced with about double the premium for smokers compared to nonsmokers. That works very well until about age 55, but then the incremental risk of smoking starts to tail off. By the time you get to age 85, it's not double the risk anymore. It's only about 125 percent of the risk.

Blood pressure is different as well. Another population study was a multivariate analysis looking at the independent relationship, the contribution of systolic blood pressure to mortality, and looking at populations above and below age 65. One of the things is that blood pressure goes higher as you get older. Under age 65, the average blood pressure is 129. Above age 65, the blood pressure on average is 143. So when we're setting those preferred criteria or setting our underwriting

decisions related to blood pressure, we need to give people above age 65 a little more allowance. If standard risk is typical risk, the typical elderly risk is going to have a higher blood pressure; we should set those limits substantially higher at that age group. If you look at the relationship of mortality to increments of blood pressure for both all-cause mortality and cardiovascular mortality, the slope of the line is substantially steeper below age 65. Not only do we need to allow higher blood pressures at no penalty, we also should be penalizing them less per increment of blood pressure.

Working through this, it's not too much of a surprise that all of the rules that we use and depend upon for effective underwriting of mortality risk don't work well when we get to the elderly. If we take the typical age of 40, we're looking at a population where the vast majority is in normal health. If they have a disease, they typically only have one disease. It's a fairly homogeneous risk group. In that younger group, it still matters what their function level is in terms of predicting their mortality, but there's no divergence here. When you look at poor function in a 40-year-old, you can identify the disease that's related to that function, and it doesn't matter whether you underwrite the disease or the function itself. They virtually always go together. That doesn't work when you get up to age 80. I had patients in my practice who had a diagnosis list as long as my arm, but they were still very active and highly functional. I had other patients for whom I couldn't identify any specific disease, but they didn't function. They could barely leave the house. They were frail. In that elderly group, now we need to look at function as the primary determinant of the mortality risk, not the diagnosis. They often diverge.

Even though our assumptions fail, we're still underwriting these people the same way. It makes all of us underwriters very uncomfortable when we look at these applications. We tend to be very cautious. Often these files are pretty thick, so the underwriter has a lot of work on the desk. The underwriter can quickly add up six diagnoses and say that no way are you going to be able to insure that. He or she wants to get on with the case. Underwriters also tend to put higher ratings on that, and it makes it harder for us to penetrate this market.

We haven't been alone in thinking about what to do about this. I've heard a lot of presentations at my meetings about what we need to be doing to underwrite the elderly more effectively. We talk about looking at their activities of daily living (ADLs). There are questions about five activities. Some of the questions are: Do you need help getting dressed? Do you need help taking a bath? When people get to that level of functional deficit, they have seriously increased mortality. We can get a little more sophisticated by looking at the instrumental activities of daily living. That's a supplement to those basic ADLs. The questions there involve things like: Are you able to pay your bills? Can you use public transportation independently? Can you manage your prescriptions independently?

There are some geriatric syndromes. Part of the contribution of geriatric medicine is to take events that don't fit neatly into our idea of diseases, yet they serve as significant markers of morbidity and mortality risk in the elderly. Among those geriatric syndromes is falling. Just the fact of a fall has significant implications in the elderly.

There are more creative ideas. Every time somebody publishes a paper that shows some correlation, we may grab at it because we're pretty desperate to find something to do better in the elderly. One of those papers says that old people who own pets have lower mortality than those who don't. I've seen serious suggestions to use that in the underwriting process. Travel history is a form of those instrumental activities of daily living. I do feel better about elderly applicants who've taken an independent trip to Eastern Europe. That shows that they are able to do something that their peers may not be able to do.

The Mini Mental Status Examination (MMSE) is a formal cognitive function test that is used more in long-term-care underwriting, but there's some discussion about using it in life insurance as well. Lastly, many of the companies have developed supplements to the paramed examination, asking the paramed to make a description of the environment or of the applicant.

There are a lot of flaws with each of these things. Almost all of them are questionnaire-type things. That self-report may be inaccurate. It's going to be incomplete. We won't be working with the same deck on all applicants if we depend upon questionnaires. They're also not very sensitive to moderate levels of risk. As I mentioned with the ADLs, by the time one of those flags comes up, the horse is out of the barn. The MMSE is also flawed in that respect. It's a test that was designed to screen for psychiatric disease in hospitalized patients; it doesn't perform very well when you're looking for subtle changes in cognitive function in the elderly. The paramed exam is quite subjective. Parameds are pretty good when you tell them exactly what to go out and measure and they're measuring something objective, like build and blood pressure. If you're asking them to give you a subjective judgment, such as their opinion of the person's appearance or the environment, you're going to get very inconsistent data, and it's going to be hard for underwriters to use that.

What's our approach? We've decided to call this "GREAT," the Gen Re Elderly Assessment Technique. We're excited enough about it that I just finished filing the patent application this past week. The key to GREAT is that if we want to get at effective measurement of mortality risk in the elderly, we have to do an objective, direct functional assessment on every single applicant. Choosing how to make that assessment is difficult. We set a couple of criteria for ourselves. One is that we needed to make sure that we could validate the measurement of mortality risk through the clinical literature. We wanted to use instruments that geriatricians are already using and for which there are some mortality data in the clinical literature.

The other goal that we set for ourselves is to make sure that this is practical. This is something that a paramed should be able to do in a single home visit as part of the pre-existing process, with only a modest increase in the time or cost of that paramed exam. We worked very closely with the paramed vendors to make sure that what we were talking about was something that they would be able to deliver for all of us.

As you might imagine, the two primary things that I think are missing in elderly risk assessment are measurements of cognitive function and measurements of physical function. The test that we want to do to measure cognitive function is called the Delayed Word Recall (DWR). There are publications on how to do this test, and we want the parameds to do this test exactly the way that it was published. You show the applicant or the test subject the words on a flashcard, and you ask the applicant to say the word and then use the word in a sentence. The words are these simple nouns: chimney, salt, harp, button, meadow, train, flower, finger, rug and book. It's important to use the same words. This is a set of words that clinical geriatric literature has validated as an effective set of 10 words. We don't want people to make up their own 10 words and compromise the transferability of the data on this test.

Then we go through that whole set of instructions once again. That's very important in the DWR. The difference between effective memory formation and impaired memory formation largely depends upon the ability to register the memory. So you have to focus on that word. The repetition and using the word in a sentence are memory aids that increase the score in people with normal cognitive function. In people with mild cognitive impairment and dementia, they're useless. That's one of the defects in their cognitive function. This memory aid does not help to increase their score, and it enhances the discrimination between normal and subtle cognitive dysfunction. Another real advantage of the DWR is that it's very simple to score. We simply check how many of the 10 words the applicant recalls, and we don't give any credit for volunteering words that we didn't ask.

We did some validation of this study ourselves. We had a population of a collaborating company that has done long-term-care underwriting as a third-party administrator for many years. Their population had an average age of 78, and they had an average follow-up of five years from the time of underwriting. There were a lot of participants in this study, including a high number of deaths, and I'll tell you how we observed that. What made this study possible is that we knew many details about the long-term-care underwriting action. We composed the study population of people who were issued long-term-care insurance, which is a pretty good proxy for being in good enough health to get life insurance. We added to that people who got declined for long-term-care insurance, whose only reason for not getting long-term-care insurance was their cognitive function measured on the DWR. We're not measuring that, so we think that this combination is a pretty good surrogate for the kinds of people to whom our underwriters are issuing life insurance contracts.

We did the mortality determination by screening the applicant pool against the Social Security Administration's Death Master File. We used that as our measure of vital status. Cognitive function has a big effect on mortality. If you look at the DWR, people who only scored 2 had almost five times the mortality of people who scored 8. That was in a five-year study, so it doesn't take long to see the consequences of having impaired cognitive function. In this population, half the mortality was in the bottom 10 percent of the scores.

The other thing that we want to do is a physical function test. A test that will work very well for that is the repeated chair rise. That, again, comes directly out of the clinical geriatric literature. When I've given this presentation to audiences where I had a longer period of time, I had them do the repeated chair rise. I do want each of you to stretch your legs a little and see just how practical this is as a test of frailty. You're all sitting on roughly appropriate chairs. There are no arms. The seat height is about 17 inches above the floor. There's a little padding here, so you can consider yourselves slightly handicapped; we should be doing this on a hard chair. The instruction is that I ask you, the applicant, to fold your arms across your chest, and now you stand up from the chair without using your arms. Stand all the way up and then sit down. In the test, you would be doing this repeatedly as many times as you can for a 30-second trial.

This is a test that I think parameds can administer effectively. It's not hard to judge whether someone has stood up and sat down and to count how many times it has happened. Remember that physical activity is the second-most important mortality predictor from the Cardiovascular Health Study. As a further demonstration of the practicality of this test, a publication where I learned about this did it in a community health fair, and we got some norms out of that test. Even people in their 80s in this study were able to do 12. I was surprised at how high that number was. This is a significant indication of why it's important to be doing a test like this in life insurance underwriting in the elderly, because out there in the general population, over 20 percent of people above age 70 are not able to do five repetitions, even if you gave them longer than 30 seconds. Just like cognitive function, there is a significant amount of undetected pathology that is important for mortality in this applicant pool.

Here's how this might change the way our underwriters perform. Right now, if you look at an applicant who has favorable cardiovascular risk factors and a clean medical history, we're tending to issue those people standard. A few companies are issuing them preferred, but a lot of our in-force data suggests that even though our clients theoretically have a preferred class above age 70, they don't put very many people into that class. However, if we did GREAT underwriting on these folks, if we did a repeated chair rise and a DWR, we would find out that their functional performance is quite different. Some of them are going to do very well. Others are going to do very poorly. The ones who do well can become a very meaningful preferred class. There are people that we're issuing standard now that we really

ought to be declining, because they have five times the mortality of people with better DWR scores.

The other way that this will have an effect is if you look at some people with a clinical history of disease, such as the coronary artery disease that I talked about in the Cardiovascular Health Study. Again, that's a population that has a heterogeneous mixture of functional ability. Some of them are very good, and we should be issuing them standard instead of rated. Some of them are much worse than they look from their medical history, and we should be declining them.

We are working hard with the parameds to make sure that they can train their people to do these tests. We should be able to have that in the marketplace within the next few months. I think we can do a better job of underwriting elderly risks, and I think that we can do a better job of getting into that market.

MR. BERGSTROM: I want to reinforce a couple of things that Sharon mentioned. Every once in a while, I get called by a reinsurer to help him do an audit. By the time I get called in to help a reinsurer do an audit, there has been a problem somewhere along the line. The question is, how much is it? There are two things that I find out. One thing I find out is that often the company being audited, the underwriting department, doesn't really know—Sharon suggested this, too—what a business exception is or what it means. I've come to conclude that when they use the term "business exception," an underwriter has, for whatever reason, permitted an applicant to slide one class, say from standard to preferred, or from preferred to super, or from Table 2 to Table 1. A "business decision" is where an underwriter or a medical director has allowed, say, a Table 6 applicant to be Table 4. Now that he's Table 4, the company's table shaving program puts him down to standard. That's a business decision. Perhaps one of the reasons that companies don't really like to keep logs of those things is that there's a mortality hit there.

The second thing I find is more of an actuarial issue. In looking at your mortality experience—this is particularly true for the preferred and super preferred classes, where we have now had to go to six decimal places to find something that's significant that would not round to zero if we stopped at five—it's the number of rescissions that happen in the company in those risk classes in the first two durations. If your rescission rate is 25 percent (many companies are at least that high) and your actual-to-expected experience is 100 percent for the first two durations, so you think you're doing pretty good, then what's your third duration experience going to look like?

MR. JACK BRAGG: We're in the experience studies business at Bragg Associates. We've just done a new old-age study. It just came out in the last few days. I'd like to tell you a little about the results. I'm 83, by the way, so I qualify as a member of the group. Anyway, we managed to round up over 400,000 lives exposed in the preferred group, 60 to 105 years of age. The central part of the group is Protestant clergy and their wives. The report does include new preferred immediate annuity

tables. I'm trying to encourage the companies to safely do single premium annuity issue. They're all scared of it. I'm trying to do something about finding out what the real mortality is like. It's amazingly good. I think Dr. Tom would believe that in this group. If you compare it with the preferred annuity group, the other extreme would be a group annuity, blue-collar. It's about a four-to-one or five-to-one ratio. These new preferred results are far under the 2000 immediate annuity tables, of course, even the ones with the 10 percent taken off. There are a couple of results that are very surprising. One that is not surprising is that it comes together at age 95 and levels off for both sexes. Actually, when you get up to 102 or so, it seems to drop again. Amazing! The far more surprising thing, though, is that above age 72, the males are better than the females. Now this is in the preferred upper-class market. That was really fairly startling, especially in the 70s. In the 80s, it sort of goes back together again. But that was quite surprising. The most astonishing thing of all is the tremendous variation. I think Dr. Tom would agree with that, too. It varies from extremely good to extremely bad. Anyway, I thought maybe somebody would be interested in the results.

MR. STEVEN I. SCHREIBER: In one of your audits you had, I think, 14 percent business exceptions and the same case had 13 percent other disagreements. Prospectively you said that you repriced, but have you ever attempted to get off the hook for the risks that you were bound to, where there was disagreement as to what qualified and what didn't?

MS. SMITH: Not in that particular case, although I will say that when I come back from an audit, I'll present my findings to a group of people, including, of course, our actuaries, and in particular, the pricing actuary who worked on that company. We'll look at the level of disagreements. If it's a 40-year-old for \$100,000, and I'm at Table 4 and they're at standard, I'm not going to be so fussed about that. I'm going to get real fussed on the 70-year-old for \$15 million that they agreed should have been Table 6 and was bound to the pool at standard rates. I'm going to ask for that additional premium. In fact, clients have started to offer it. To me that says a couple of things. One is that I'm probably not the first reinsurer in there finding stuff. Also, they clearly recognize that when they're making some of these decisions, especially when it's a business decision, that they should not be auto binding the pool. Keep it with you in your retention. Talk to one or two of your reinsurers and make sure that you're ceding it right so that you don't end up in a situation. In the last year or so there are a few cases, especially the declines to standard, especially when the case is documented as such. You all felt it was a decline, but you bound the pool because you needed to insure this life. He was a very important life. Then we've said, "Come on. It's not the manner in which we expect to do business with you." We haven't taken a tough line yet, but I know some others have.