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**UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS**

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*This interactive forum will address wellness-related issues, such as, "Is alcohol cardio-protective?" "What are the alternative medicines?" "Modalities and why do they work?" These and other wellness topics will be addressed, with audience interaction with the speakers.*

MR. HENRY C. GEORGE: I am the senior vice president of Home Office Reference Laboratory. When we conceived this idea of having a presentation that is related to the subject of wellness with some intersection with risk selection and classification, we said that the ideal way to present it is to take it to the world's toughest audience, the SOA; if you like it, everybody will like it. We also wanted to have one representative of each of the three professional disciplines that intersect on the subject of risk selection and risk classification. I'm going to introduce each of our speakers before they make their presentations. Each of our presenters will speak for a short time on a specific vignette related to the subject of wellness. Then, when all the presentations are made, we will open the floor to questions in what is called an interactive forum. The first presenter is Dr. Marta Kushnir, vice president and chief medical director for CIGNA Reinsurance Company in Bloomfield, CT. Marta is a native of New York. She is multilingual, which means that at any point in time during this lecture she could lapse into French, German, Spanish, or Ukrainian. Marta is a frequent speaker and is widely published. I've had the privilege of introducing Marta on two occasions in the last 30 days—now and at the Chicago Underwriting Conference.

DR. MARTA KUSHNIR: The whole subject of alternative medicine has become very popular, ever since a 1992 survey was published in the *New England Journal of Medicine* that showed that a very large percentage of Americans will pay out of pocket to see alternative practitioners. This is probably nothing very unusual if we think about the history and the way that health has developed during the last 30 years. Initially, people cared if they just survived. Survival was the number-one issue to do with health. Then it was not only surviving, but being disease-free and surviving. Subsequently, activities such as being able to get up and feed and clothe yourself became more important. Now and even in the 1980s, the idea of well-being and quality of life have become very important to us and we wanted to know what we can do to be helped. Although this doesn't seem too dramatic, this change has occurred during the last 30 years, and people are not only concerned with their survival, but they are concerned with how they're going to be living.

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What are alternative therapies? They can range from anything such as acupuncture to hypnosis to massage therapy to music therapy and even prayer intervention. The prayer intervention is particularly interesting. Somebody did a study on women with metastatic breast cancer and found that the women who were in prayer groups (I don't mean Catholic or Protestant, just basically any type of communal sharing and praying) had an 18-month-longer survival period than women who were being treated for this same disease, with the same extent of disease, without this intervention. Something has to be going on that makes this work and, again, we're going back to the quality of life as opposed to just survival. The chiropractic doctors are now being fully reimbursed as regular physicians, and many laws have been mandated recently. If any of you deal with health, I'm sure you know that. Because of the surge in interest in all of these types of alternative therapies, licensing these practitioners has become very important as well. It probably will become even more important as time goes on.

When the study about alternative therapies was published in 1992, it was found that 34% of all Americans utilize some form of alternative therapy, and 72% of that 34% never told their physicians about this. This was all done on the sly. Obviously, this is market-driven. People need this, people want this, but they think that their doctors will laugh at them, or somebody will just say it's bogus. Now of those 34%, one-third will make 19 visits annually to an alternative health care practitioner. People don't see their regular physicians that often. Think about the amount of money that's being spent on this, the effort being put out by people to actually find chiropractors, find hypnotists, or whatever. People are making a major effort to look for these types of therapies. Of course, we can think of capitalizing on it. The 1992 study also showed that the highest users of these alternative therapies are mostly on the West Coast, so far, but they were well educated (college or higher), and in the upper income group. They are in the baby boom or Generation X age groups.

As insurance people, we certainly are targeting this population all the time. In 1992, \$13.7 billion was spent on alternative therapies; \$10.3 billion of that was paid out of pocket. People went out and spent money on massage therapy, acupuncture, and chiropractic care. This is something that we have to focus in on. Within our industry, there is a lot of room to take alternative therapy into account. I hope we are able to consider that in the way that we look at people and the way that we classify them.

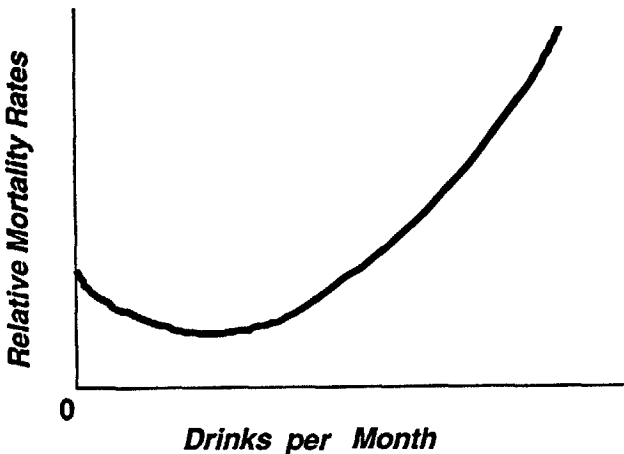
MR. GEORGE: I spoke at a meeting in San Diego about underwriting and its implications, and one of the subjects we talked about was the new things that people are doing with insurance. Take, for example, herbal remedies. Many people are growing herbs, and guess what's popping up in the medical literature? Reports of herbal toxicities, people developing hepatitis, liver failure in the worst scenario, and people with increases in those mystical liver enzymes. We have a problem. The immediate impact on insurance is that people indulging in these alternative strategies silently change their physiology and their body chemistry and wind up being classified, in this case, as potential alcoholics. You sometimes can't tell the difference in a blood chemistry test between someone who's consuming large quantities of herbal remedies and someone who is consuming large quantities of Jack Daniels. We'll come back to that later on.

Our next presenter is Rick Bergstrom, who is an FSA. Rick is a consultant with Milliman & Robertson in Seattle. He is famous in this industry for his series of what I would call value of laboratory testing in insurance.

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

MR. RICHARD L. BERGSTROM: My portion of today's talk is going to be the age-old question, is alcohol cardioprotective? I need to point out that much of the information that is contained in my talk was taken from a very good source. It is a paper written by Vera F. Dolan, entitled "Moderate Alcohol Intake and Reduced Mortality: Illusion or Preferred Risk?" It was published in the fall 1993 edition of *On The Risk*. Mr. George is the editor in chief, so if someone is interested in getting a copy of this particular paper, Hank will be able to arrange that for you. There have been numerous studies performed in the last 30-40 years in the U.S. and in other countries that seem to indicate that there is a relative decrease of risk by death from cardiovascular heart disease for subjects who consume moderate levels of alcohol. Some of these studies were performed by insurance companies but the vast majority of them are clinical in nature. They're not certainly actuarial studies, but they're prospective studies. As you might imagine, there's also a fair amount of variability of the results of the studies, even to the point of defining such words as *drink*. We'll talk about that in a little bit. But in general it does appear to be a general pattern of relative mortality, which is higher for those who abstain totally, versus those who drink moderately, versus those who drink excessively. This of course takes the shape of the famous J-shaped curve (Chart 1).

CHART 1  
THE J-SHAPED CURVE



Although there have been claims by the wine industry in recent years (most notably by the California wine industry) that wine confers a cardioprotective effect, the research that's done in the clinical studies tend to indicate that there is no difference between the type of alcohol that's ingested. Whether it be beer, wine, or spirits, the same pattern seems to emerge. In fact, in the studies that are done, they do not even attempt, at this point, to distinguish between the type of alcohol.

As one reviews the results of the various studies, it's apparent that there is at least some consistency needed in the definition of the word *drink*. For purposes of the studies that I've reviewed, this is the definition: .5 ounce of pure alcohol is what is considered a drink, and that is roughly translated to one 12-ounce mug of beer, a 5-ounce glass of wine, or 1.5

ounces of 80-proof liquor. The most convincing information that I've seen about the relationship between alcohol intake and cardiovascular heart disease and mortality comes from what we call prospective epidemiological studies. These studies consist of following large numbers of individuals through surveys over many years. Statistical analyses are then used to determine what, if any, association there is between total mortality (or if it's cause-specific mortality in this case), and moderate alcohol ingestion. In the overwhelming majority of these prospective studies, it is generally observed that there is a higher level of mortality for those who are abstainers versus those who drink moderately, versus those people who ingest large amounts of alcohol. This brings us back to the J-shaped curve.

One of the first questions that we need to ask ourselves, particularly for those folks who claim to abstain is, what is the definition of an abstainer? In the early studies that were done, no distinction was made from the people who claim to be abstainers as to why they abstain. Do they abstain for religious reasons or for health reasons, for example, recovering alcoholics? In the later studies, it was thought it was important to determine those who were considered abstainers because of choice, not need. There still was no difference in the curves. The J-shaped curve still showed through. I don't think it's a matter of definition at this point. If you look briefly at some of the other causes of death and how they relate to alcohol intake, you'll note that a British study was done in the 1960s that showed that there was still a definite J-shaped relationship to death by various causes of stroke. If you look at violent death, the J-shaped relationship disappears. There is a very close relationship between increasing mortality by violent death (murder, suicide, and so forth) and alcohol intake. The same is true with cirrhosis of the liver. There's no J-shaped curve associated with cirrhosis—mortality just tends to continue to increase as level of alcohol increases.

Regarding cancer, again there's a strong association between cancer and alcohol intake, but the cancers tend to be very site-specific, such as in the stomach or lung. Some of the other risk factors that needed to be homogenized in doing these studies were age, gender, and smoking habits. The groups that were studied were segregated by these three things. It was found that in age, for example, the J-shaped pattern existed in all age groupings that were studied. But, the cardiovascular protective effect was most notable at the older ages, rather than at the younger age and I think that makes sense. Males and females also showed a common pattern. The difference here is men were allowed to drink more. Women were only allowed to drink a glass to get the optimal cardioprotective effect. Regarding smoking habits, as you might imagine, the J-shaped relationship still exists as the alcohol intake increases, but the amount of tobacco consumption forces the curve to shorten, and to get very steep for increasing amounts of tobacco consumption. One of the most often asked questions is, why does this happen? There isn't a very solid answer yet, at least to my knowledge, but one of the hypotheses is that there's a cardioprotective effect of alcohol. As you ingest alcohol, the blood increases its amount of high-density lipoprotein (HDL), and this tends to elevate as alcohol consumption increases. The increasing serum levels of HDL have been used very commonly in our underwriting practices, and this was considered to be a possible reason. The studies that were done that specifically related HDL to alcohol ingestion indicated that there was some association or correlation, but that's not the only answer.

If we accept the premise that there is indeed a J-shaped curve, would we want to choose to underwrite our preferred risk products in that fashion? In other words, would we permit ourselves to not allow nondrinkers or abstainers to qualify for preferred risk products? I don't know whether anybody out here does such a thing. Are abstainers qualified for

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

preferred risk products? Does anybody not qualify abstainers from preferred risk products? Perhaps there's a moral issue, but I also think there just isn't that much of a difference. I also believe that there are many other factors and risks that the underwriters need to look into in developing the total underwriting profile. Some of these could be positive effects, which would offset any negative of being an abstainer. A study was done in Albany, NY on men between the ages of 38 and 55. It started in 1953 and continued for 18 years. Table 1 breaks out the males by drinking status: total abstainers versus those who have between 1 and 58 drinks per month, versus those who have between 59 and 118 drinks per month, versus those who consume more alcohol than that. The far right-hand column shows relative mortality rates per year.

TABLE 1  
CORONARY HEART DISEASE MORTALITY RATES—  
PROSPECTIVE STUDIES<sup>a</sup>

Drinking Status (drinks per month)	Total at Risk	Rate per 1000/year
0	585	6.7
1-58	842	4.0
59-118	175	5.4
>118	160	8.0

<sup>a</sup>Note—Population includes males from Albany, NY, aged 38-55 years, who were studied for 18 years beginning in 1953-54. The number of deaths was not available.

The mortality rate for abstainers is 6.7. It's 4.0 for those who have between 1 and 58 drinks per month—about a one-third decrease. For those whose drink between 59 and 118 drinks per month, it goes up to 5.4, but it's still a lower rate than the rate for those who abstain. For those who are considered heavier drinkers have maybe four or more drinks per day, mortality finally goes up above the abstainer mortality. This is relative mortality for coronary heart disease. The same study looked at total mortality (Table 2). This particular grouping has broken the drinking status down into finer segments, but you can see that the abstainers have quite a bit higher mortality than those who drink even up to 58 drinks per month. And, of course, mortality goes on up from there. I don't know if we can reach a true conclusion from this, but there's no question in my mind, at least, that there is some significant relation between level of alcohol intake and the cardioprotective effect of moderate levels of drinking.

MR. GEORGE: If you look at some of the recent literature on this subject, an interesting insight suggests that maybe the mechanism of the cardioprotectivity of wine may not be what we thought, but it may instead have to do with the substance called a bioflavonoid. We won't be able to discuss this in any detail because it's very complicated biology, but there are nonneutrogen substances called bioflavonoids. If you go to a vitamin store, you'll see vitamin C also containing other components: rose hips, bioflavonoids, etc. One particular bioflavonoid is very abundant in red wine and seems to have the strongest association of all of the ingredients and all of the alcoholic products with being cardioprotective in preventing coronary heart disease or at least fatal events associated with coronary heart disease.

TABLE 2  
TOTAL MORTALITY RATES—PROSPECTIVE STUDIES<sup>a</sup>

Drinking Status (drinks per month)	Total at Risk	Deaths	Rate per 1000/year
0	585	146	13.9
1-18	373	47	7
19-38	303	48	8.8
39-58	166	37	12.4
59-118	175	49	15.6
119-178	100	24	13.3
>178	60	27	25

<sup>a</sup>Note—Population includes males from Albany, NY, aged 38-55 years, who were studied for 18 years beginning in 1953-54.

The third presenter is Gary Lee who is chief underwriter for Winterthur Life Re Insurance Company in Dallas. He's a native of New York. He is the associate editor of *On the Risk* and, like Rick and Marta, is a member of the planning team for the International Underwriting Congress. The first World Congress devoted to subjects of risk classification and selection will take place in February 1997 in Mexico City, Mexico. These three folks and I will be part of the team who will plan that meeting.

MR. GARY Y. LEE: Yes, I am the token underwriter, but I want to make a point that is kind of in slight disagreement with Hank. We're all underwriters in here. People at my end of the profession may do single-case pricing, but you all do multiple-life, large-risk pricing. Let's keep that in mind as we start turning this session into an interactive forum. By a show of hands, do we have any vegetarians in the crowd? OK, just one. Then for the rest of you, this will be the one major take-home point from my portion of the session: folks, your mother was right, eat your vegetables. One of the premises that I'd like to present to you is that if we're talking about underwriting implications of wellness programs, then you're going to have to accept the premise that some foods we eat cause disease, and other foods we consume cause illness. How many people would agree that some foods will cause illness? How many people think that some foods will give you good health? That's good because now we can go beyond that and start looking at what it means to us in the underwriting profession, what it means to us as actuaries, and what it means to us in our business of placing life risk on our respective books at the proper price. I've gone through my files in the office to pick out a short random sample of some interesting studies that seem to demonstrate a link between diet and disease.

Here's an interesting fact I'll give since we're in the city of New Orleans. There are two cities in the world that have the highest incidence of heart disease: New Orleans, LA and Oslo, Norway. What is the common connection between those two cities? The common connection is the diet. For those of you who have savored some of the fine cuisine that this city has to offer, you know that there are many fried foods and many creamy sauces (many foods that aren't good for you). Bear that in mind. In Oslo I think they eat a lot of fatty fish and cream sauces.

But since we're talking about underwriting, I will ask you to consider the following questions when you begin to assess the implications of wellness programs on underwriting and on your portfolios. These are questions that I would present to my own underwriters in

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

trying to determine whether there are underwriting implications to wellness programs. The first question is, can you underwrite for the expected positive mortality implications of wellness programs? We're talking about alternative therapies. We're talking about whether we can determine if someone drinks as much or as little as what they say they do. We're talking about exercise programs. We're talking about any type of program that has to do with wellness. Can you underwrite for it? The next question that I would ask my underwriters is, can you design underwriting guidelines to protect yourselves against the potential increased level of antiselection from applicants looking to qualify for the lower premium rates? As an example, I will point out the smoker, nonsmoker split, which then evolved into preferred, which now has evolved in certain companies to something called biological age underwriting. Can you do that? Is it possible to select those risks from your entire applicant pool? Is it possible to secure reliable underwriting data from which to base your decisions?

Are your underwriters equipped to deal with the increased levels of marketing pressure, resulting from the need to sell more policies to maintain their current levels of commissions? Believe it or not, I've thought about these questions and I have the answer. A definite maybe. We could probably do it, but here are a few other things for you to consider. We've entered dangerous territory here, because we're talking about subjective human behavior and people having to report this behavior. There's a reason why underwriting requirements have evolved the way they have. We ask for information on an application, but we don't believe it, so we ask for attending physician's statement (APSSs) to confirm the medical information. We ask for inspection reports to confirm the other information that we've received from the application. If we believed the applicant to begin with, we wouldn't ask for all this confirmation, would we? There are many issues here. It's a complex topic. But one of the primary methods for determining and acquiring this type of underwriting information is in the use of questionnaires.

I will point out a few things for you in thinking about questionnaires. Dietary questionnaires will unfortunately yield biased estimates of intake. Individuals will report what they think they ought to be eating, as opposed to what they eat. The U.S. government guidelines for servings of fruits and vegetables per day is five. Aside from our lone vegetarian in the group, how many of us can say that yesterday we ate five servings of fruits and vegetables? (Two out of 15, that's not bad.) I have to admit that yesterday I did not have five servings of vegetables, but if you were to ask me about my diet, I would say it's good. I'm a near vegetarian; I don't eat a lot of meat. How many of you remember what you ate for breakfast yesterday? Think about your applicants out there and think about recall bias. "Let me think, yesterday I had a muffin; no, I had a muffin today. Maybe two days ago I had a muffin; I had a muffin sometime." Recall bias is a problem as well. Quantity is a major issue when you're talking about food. People do not exercise enough either.

A recent article in *The New York Times* had a good picture of what the USDA recommends as its daily servings. The recommended amount of meat you should eat per day is about three or four ounces. People have a problem with portions and they have a problem with knowing when to stop eating. I have two small children aged seven-and-a-half and almost five. As a parent, I can tell you that it's difficult for me to see uneaten, untouched food sitting on their plates. Cleaning their plates by eating what's left is almost an automatic response, because it's very difficult for all of us to shut off our mothers. "Finish your food, eat your vegetables, drink your milk." When you can turn that off, then you can start turning toward help. If we have been as good as we say we have been, with all this fat-free

food that's coming out, then why has the Centers For Disease Control in Atlanta most recently just come out with the information that one-third of the population is overweight? If we're as good as we say we've been, then why are we fat?

I must conclude my portion of this session by saying that the underwriting implications of wellness programs are generally unknown and are uncertain at this point. But we will be guaranteed one thing—there will be a lively debate between now and the point where we expect profits to emerge from these blocks of business, if we decide to further subdivide the standard group into a superpreferred.

MR. BERGSTROM: I'm curious as to how many of your companies have preferred risk products, and is there more than one classification of preferred?

MR. GEORGE: Of those who do, do you have more than one classification of preferred? Is anybody from CNA here? CNA just came out with a series of term products with six preferred rate classifications. I don't know what the distinctions are, but sometimes I think it's probably cut a little too thin. I don't know if wellness programs are built in there or not. I'm not sure what the underwriting implications are. The preferred classifications are so restrictive so that no individual other than Clark Kent would be in the special elite risk category. My dear friend John Krinik, who with Rick and I comprise the faculty for the annual seminars for Critical Issues in Underwriting, has written articles on this subject in *Probe*, the publication that circulates mainly to senior executives in insurance. He has railed against super preferred risk products as not being in our industry's best interest. On balance, even though I work for a laboratory that sells services to people to differentiate a better from best from superb, I would have to fall on the side of John and argue that that may not be in our best long-term interests.

MR. LEE: Here's another piece of market information that you might find interesting. Our professions are a little different. We're doing the same thing, but we're doing it a little differently. Actuaries look in the rearview mirror. You want to see experience developing, you want to see how things look. Underwriters, on the other hand, are forward-looking. We use a crystal ball. There is an interesting development. I received a direct mail piece from Zurich Life outside of Chicago and it was for a ten-year select preferred term plan. I dialed the 800 number, called up the company, and got its direct insurance agency. I was actually underwritten over the phone for preferred. The company has gone to a three-year, nontobacco to qualify for preferred. They ask you questions about your exercise habits and they also told me that they do not sell the product to smokers. What does that tell us? I don't know. I'm not quite sure. Maybe they've discovered that agency pressure is too great, that they can't make money on this superselect term business. I think the movement toward a three-year nontobacco and not issuing any policies to smokers is significant. Much of the antiselection has been eliminated there.

MR. GEORGE: That's an interesting concept.

MS. LISA C. CARRIERE: Are you saying that they don't test at all? They take your word for the fact that you are a nonsmoker?

MR. LEE: They test. I have a situation now back home in Dallas, where \$1.4 million was issued in preferred nonsmoker rates. If you look at that file, the blood is clean and the urine is clean. The second application comes in eight months later for an additional \$600,000 of



## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

coverage. We have a nicotine level that's sky high. We have a serum nicotine out of the blood that's sky high. The woman claims that she never smoked, and she can't say that she chews tobacco, smokes a pipe, or smokes a cigar, because I don't know many women who chew tobacco, or smoke cigars or pipes. What am I going to do?

MR. GEORGE: Reform the original policy. Rescind the first policy.

MR. LEE: That is what we are going to suggest to our client. But what's happening at the Zurich Company is that they're saying they're tired of this. They're tired of getting excuses. They're tired of getting contamination of their preferred block by smokers and other forms of tobacco users. They're not going to get the mortality they're looking for, they're not going to get the profits they're hoping for. What's the answer? We're not going to issue this to smokers, and we're not using agents.

MR. GEORGE E. RONCZY: Rick, you mentioned a difference in the cardioprotective effect for male/female, the amount of drinking being higher for males over females. Is that weight- or gender-driven?

MR. BERGSTROM: That seemed to be gender driven. If the bottom of the optimum mortality or perceptive value on the J-shaped curve for males is about two drinks per day for men, it tends to be closer to one drink per day for women.

DR. KUSHNIR: If I can interject, women metabolize alcohol differently than men do, much slower actually, so women have a lower tolerance to alcohol and will keep it in their systems longer. Women don't need to drink as much as men do because they're slower metabolizers.

MR. GEORGE: Let's say that in a different way: if women drink as much alcohol as men, they suffer more adverse effects from the same quantity of alcohol. In fact, the amount of alcohol that has been deemed by epidemiologists to be safe for females is half of the threshold that's deemed to be safe for males. If you look at studies that have been done on female alcoholics, individuals who abuse alcohol or who are treated for alcohol abuse, the mortality and the outcomes in female alcoholics are worse than those in males matched to the same degree and duration of abuse. Alcohol is more toxic to women than to men, all other things being equal.

FROM THE FLOOR: I'm interested in your comments about family history as part of a preferred criteria program. One of the comments, or a complaint perhaps, that we get from our field is someone will be in perfect health, will exercise regularly, will see a doctor regularly, but there will be a history of cardiovascular disease in the family, and therefore, under our criteria, we may not be able to say that person is preferred. Of course, the agent will argue that this person is taking steps to avoid what has happened in the family. What's the best response to that?

MR. LEE: The best response is to try and look at the bigger picture. Look at the lifestyle changes that have occurred in the U.S. and Canada since the turn of the century. It should be no coincidence that the rise in incidence in coronary heart disease in the U.S. and Canada has a direct correlation from the point in time that refined flour was introduced into the diet. Refined flour was introduced around the turn of the century and people started thinking that it was better and cleaner. The wheat bran was removed, the vitamin E was stripped out,

and all of a sudden the U.S. has one of the highest coronary heart disease (CHD) rates in the world. To answer your question, the change in lifestyle has been very dramatic. Most of the parents of the people we're looking at now were involved in physical labor, whether it was farming or some type of blue-collar occupation. There was a transformation over this past century from an agrarian society through a worker society to a knowledge society, and we are part of that group of knowledge workers.

MR. BERGSTROM: If a female is applying for coverage and there's a close history in the family of someone who died of breast cancer under the age of 50 and she's 48, there is a very strong association there. It may be that the associations aren't as strong for other health history interviews.

MR. LEE: When you talk about family history, you can throw out all sorts of interesting information at your agents when they start complaining. Say that in males with a family history of heart disease under the age of 60, the CHD risk in that generation is five times greater than the previous generation. Or if it's female, it's seven times greater. You can throw out interesting facts such as that, but one of the keys to remember about family history is that there's a lot more being transmitted from one generation to the next, aside from genes. Dietary habits and exercise habits are passed along from one generation to another. Who are our first heroes, our role models? Mom and dad. We're the first generation that's experimenting with this wellness. We're getting out there because we're seeing what's happening to some of our parents.

MR. GEORGE: I want to get back to this question: the producer says the client is an individual who recognizes that he comes from the sort of background that I do—working class, Midwestern, saturated fat, obesity, couch potatoes who thought exercise was putting beer in the trunk of the car—and this individual changes his life and does all of the popular interventions—exercise, abstinence from tobacco and tempered alcohol, knows all five food groups without prompting and cuing—because of the albatross of a grossly positive family history, this individual is saddled with the burden of not qualifying for preferred.

I worked at a rather conservative, quiet company. In that particular organization, there was a time when if you had a grossly adverse family history you could be rated per se. Not simply not preferred, this is in the prepreferred era, you could have been charged the equivalent of a Table A, Table One, if you had a horrendous history of premature circulatory disease of the acquired form. What's the bottom line? The producer says the client has done everything conceivable to prevent these things from happening to him and yet he is being surcharged because of things beyond his control. I have several responses to that because I've had this question a million times. Response number one: the part 2s in insurance company applications are mediocre when it comes to soliciting information about family histories. They often allow for the nonspecific responses. There are a variety of diseases of the heart and circulatory system, some of which are genetically mediated and some of which are acquired through lifestyle. Some have no association at all with predicting adversity in siblings and in future generations. For example, let's say that daddy died at age 44 of rheumatic heart disease. That has no association with increased mortality in the children and grandchildren of that family. That's an acquired form of heart disease and is not linked to diet choices. Very often, the application forms don't specifically elicit enough history on the causes of death of the family members. You wind up with some individuals having a very strong, positive history of heart disease listed for reasons that have no bearing on their insurability. We need to have better, more specific, more instructive

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

part 2s and better agent training, so that if we are going to use family history information, we have salient family history information. We're only concerned about a subset of circulatory illnesses, those of the atherogenic origin: coronary artery disease, cerebrovascular disease, etc.

The second thing I would say is that if you look at the causes of these diseases that we're so concerned about, there is a genetic component, there are lifestyle components, and there are other components that we haven't even begun to illuminate yet. Some individuals are preprogrammed by their genetic endowment to be at horrendous extra risk: people who have primary hypercholesterolemia, perhaps being homozygous and both the parents have genes for high cholesterol. Those individuals may not be able to be corrected by any medical intervention and will be at significant, life-long increased risk. If there is a strong family history of that, and if that trait has been passed onto the progeny, then there is an increased risk. The producer simply has to accept that that's as true as someone in any other lineage in which there is a genetically transmissible illness that produces excess mortality. The producers have to grasp that there is some of that in the group. Look at Jim Fixx, the legendary runner, athlete, and public speaker who had a strongly positive family history and did about everything he could do to intervene against it. He changed his lifestyle, acquired a running habit, ate a healthy diet, and dropped dead 35 years prematurely of a myocardial infarction. Sometimes you can't change the programming completely.

MR. LEE: I've heard this about Jim Fixx quite a few times. Yes it is true that Jim Fixx died at the age of 54 from myocardial infarction while running, but his father died at 44. There is speculation that the lifestyle changes that Jim Fixx made in his own life helped to prolong his life by ten years, but nobody knows for sure. All of his lifestyle changes could not combat genetics.

MR. JAMES R. SENN: I'm interested in the panel members or anybody else here doing a little gazing in the crystal ball and discussing the future of biological age underwriting and where you might see that going during the next five to ten years.

DR. KUSHNIR: I happen to be doing a research project at CIGNA Reinsurance. We just began doing a project where we're using biological markers, things such as hearing acuity and reaction time, among functions to see what somebody's functional age or biological age, rather than chronological age is. I have friends who are my age who look and act much older. Friends of my mom are in their mid-60s and they look incredibly young. They are fit and swim 20 laps per day. Some people in their 50s can barely get up out of a chair and some people in their 80s are running marathons. Why is that happening? As an industry we have to look at this because more and more of the population is going to be older in the next 10, 15, 20 years. I've seen many more applications for first-time insurance buyers who are over the age of 75 and they're standard and are good risks. They exercise, they eat well, they're not overweight, and they have good laboratory results. We do have to come up with a way to biologically underwrite these people and also protect us as far as the risk selection is concerned, however, we must be fair to these applicants who are healthier than their counterparts of the same age.

We're going to try to continue it for five years and see if we can document a trend. We do have definite data that correspond to each age; you have a definite hearing acuity, you have a definite reaction time that is correlated to your chronological age. We may find that there

is a trend maintained. For somebody who is age 55 but who tests age 50, will they test age 51 when they're age 56? Will they test age 52 when they're age 57? That's exactly what we're looking at, and hopefully this will facilitate underwriting and will eliminate many questions and many inspection reports and the attending physician statements (APSs) that we now use to thoroughly check and corroborate to verify that people aren't lying to us.

MR. GEORGE: I don't know if you know this but about a decade or so ago, a fellow from southern California tried to market a product that was based on multiple functional components of biological-versus-chronological age. A number of prominent insurance executives had a chance to look at this product and evaluate it. It looked as if this was going to be something that was going to be introduced into insurance medicine, and then it disappeared.

DR. KUSHNIR: I know what happened to it. I work with the man who designed this. He is back with a vengeance, and he designed software and hardware called the age scan, The Hoshell Scan. There were 12 biological tests; the thing took forever to do. I was out in California when I first began designing my own project and it took such a long time to take this test that you didn't want to bother with it anymore. He did a product for Transamerica in the mid-1980s based on this biological aging, and he also did a very large study of 4,000 people among 17 insurance companies by using this age scanner and all 12 parameters. The problem that he ran into was he couldn't get people to come back the next year, so he couldn't document anything except a one-shot deal. He had 4,000 people, and all these data, and they didn't mean anything. The product that Transamerica designed could not be sold, because the agents could not talk their clients into coming in and taking this two-hour test on this computer. It was very difficult to market and sell. These were the solid days of the 1980s when all insurance companies felt confident that they could sell anything to anybody and they didn't need to have any additional types of testing or any gimmicks. It was just aborted after a year because it didn't make money and people wouldn't take the test.

MR. GEORGE: In preparing a lecture that I'm going to be giving in Europe at the end of the month, I looked back at some of the old proceedings of the Medical Directors Association. Lo and behold, Bill Kinnell from Framingham, who was one of the most prominent epidemiologists in America (from the legendary epidemiologic study called the Framingham study from suburban Boston), told the medical director community 20 years ago that the ultimate marker for the biologic age of an applicant is the timed vital capacity test. It tells us about lung function and the ability to breathe. To what extent is the insurance industry making use of the timed vital capacity as a screening test for insurance? Answer: almost not at all. We are still using what I consider to be the most inappropriate underwriting tool in the known universe: the chest x-ray. But we are not making use of a marker that a prominent epidemiologist called the best available marker for biological age. That's unfortunate.

DR. KUSHNIR: I agree with you about it being the best marker. I actually used timed vital capacity as well as forced expiratory function in my project. But the problem with using it for our industry is that it is not very cost-effective. It's a very expensive test, and if people are not instructed properly, they will not do this test the right way and the results will be wrong.

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

MR. GEORGE: If the paramedical industry would develop the technology to make it cost effective with reproducible results, would it not be appropriate for the timed vital capacity to forever replace the obsolete chest x-ray as a screening tool?

DR. KUSHNIR: Absolutely, because there is a definite relationship between mortality and lung function; that's been studied. I think it was a Transamerica study that documented this, but they found that it was just not cost-effective, because these tests have to be given by technicians. They're very difficult to explain and unless you can explain the way that the test is done to somebody who is going to be performing the test, the test may be done poorly and you will get bad results. You'll be underwriting people incorrectly.

FROM THE FLOOR: With regard to administering the test and making sure that the subject understands it, is it possible for the subject to distort the results of the test by how he or she takes the test?

DR. KUSHNIR: Absolutely. We couldn't afford to have a technician around all the time to be doing these tests. I wanted to design a test that people could understand on their own. It would be user-friendly; everything is on the computer screen in front of them. I found that it is possible to properly explain the test so that you don't need a technician, but you have to assume that these people understand what they're reading and can follow the instructions. It's unfortunate but most older people have more difficulty understanding instructions and understanding how they should breathe, how they should take a deep breath, or how they should exhale. The elderly were the ones who would distort their data the most because of not understanding. There are ways to get around it, by making something user-friendly or explaining things very explicitly. You still run a chance of people not understanding, though, and messing up.

MR. GEORGE: I think I heard the question a little differently. I think I heard, is it possible for an individual to execute this test in such a way as to give distortively more favorable results? The answer is absolutely not. If that's what you meant, then the answer is no. There are only two ways you can get results: correct and distortively unfavorable. It'd be a paradox. At the VA hospitals, they bring around the pulmonary function cart for the patients before discharge. All these veterans know exactly what they are supposed to do. What do the VA residents do when the cart comes around? They get about half a liter of air, and they're in for a while. You can distort pulmonary function test results, but only in a way that makes you appear less well. There's no way to appear healthier, and therein lies the tale. The problem, as Dr. Kushnir said, is that the technology is bulky. It has to be administered by a competent technician.

MR. TIMOTHY J. RUARK: The testing that we're speaking of is interesting. Assuming that it was successful and five years from now we have a good data base, and we've evaluated it and we even have a good idea of how to use it, what happens next? If you can get a company to adopt that practice, then if somebody is 50 years old, you're going to look at the person's biological age for determining premiums. Two people are age 50: one is biologically rated 46, the other 54. You wouldn't expect to write any insurance on the 54-year-old biologically, because he or she can go to any company that doesn't use this type of testing and be rated as a 50-year-old, his true age. You end up putting a very favorable deal on the table for the person who is biologically 46.

DR. KUSHNIR: That's the premise, though.

RECORD, VOLUME 21

MR. RUARK: Exactly, and I'm not saying that that's a problem. I think it's very good for the companies that do adopt your practice. But I think it's akin to companies moving from nontobacco rating to tobacco rating. When a couple of prominent companies started rating people nonsmoker, basically all companies that could had to fall in line, because otherwise they would be left with inferior risks.

DR. KUSHNIR: Your point is valid. What's going to happen with the other people who are not functionally better than what their age determines? By saving money on people who are better risks biologically, there can be more uniform pricing. The bad-risk people don't pay too much more than they would otherwise and the good-risk people pay so much less that it all kind of evens out. Maybe that's a very simplistic way to look at it, but it's more or less to reward people for being very healthy, something that the insurance industry has not been known to do. We're used to finding fault with people because of their health, but if we can reward them, then we can probably make back some of the money on the bad risks.

MR. RUARK: From the point of view of the industry, I agree that things would work out; everything would average out. I guess my point is more that to the extent your work is successful and meaningful and to the extent a few companies adopt your work, those are the companies within the industry that would benefit mostly.

DR. KUSHNIR: Right.

MR. RAYMOND E. DIDONNA: I would like a comment from the panel or from anybody, on the preferred class, specifically the expansion of it, specifically preferred smokers, preferreds at older issue ages, 70 or over 80, and the expansion of preferred classes, superpreferred, etc.

MR. GEORGE: We did talk a little bit about this before, but because this is such an important subject, this preferred risk issue, have we gone too far? Should we go further?

MR. LEE: I'll answer your question with a question. How much further can you subdivide your standard class? You are operating under one major assumption that your underwriters will be able to pick these people out and appropriately place them in the appropriate risk classifications. I don't have an answer for that. It all depends upon your individual company's underwriters, underwriting guidelines, relationship with the field, how much field pressure there is. There's a tremendous amount of field pressure out there. I see many things that should not be happening from an underwriting perspective, because marketing rules. You have to be able to determine whether your underwriters can appropriately classify and place them in all of these buckets that were created.

MR. BERGSTROM: I mentioned one company that actually has six preferred classifications, and I think that's overkill. But I do know there are companies that are very seriously looking at at least two preferred classifications. Their justification is, if we can take our aggregate, break into preferred and standard (many companies try to get a proportion where maybe 60% qualify as preferred), we could break that 60% down into half and a standard of a third, a third, and a third. I'm not sure what they are going to sell though; I think they can probably underwrite it. I think we can probably price it, but I think it becomes more of a marketing problem.

## UNDERWRITING IMPLICATIONS OF WELLNESS PROGRAMS

The highest I've seen companies issue preferred risk at is 75, so I don't know how much higher it can be; I'm not even sure what standard is above that. I have seen companies go up to 75 or claim to do that. As far as preferred smokers, I think it's more of a marketing issue. I think you can look at the total profiles of tobacco users and if many of their characteristics are positive, they might qualify as in some kind of a preferred risk. Yes, I think you could do that, but again you're talking about splitting 30% of the population into what?

MR. LEE: And you're also talking about splitting hairs, because I did some research on preferred risk for a presentation at the SOA annual meeting in 1990. Smokers who smoke up to nine cigarettes per day will have better mortality than smokers who smoke a pack a day, and better mortality than smokers who smoke two packs or more a day. How will you be able to determine that when people say they only smoke eight cigarettes per day? It is not that easy.

MR. GEORGE: I've probably written and spoken as much on the tobacco issue as anybody in the insurance industry, and I think preferred smoker is a very poor idea.

MR. RICHARD F. PLUSH: With respect to your talking with the biological markers and all, has there been any discussion with the regulatory bodies especially because, in many states, you now have to file maximum cost-of-insurance rates, even for substandard classes. From what I'm hearing, you're saying you could classify a 50-year-old as being biologically a 55-year-old. Do we see any problems with that from the regulators?

DR. KUSHNIR: I'm sure that there will be, and I hope to come up with data that will enable me to have issues with the regulatory committees. If I can produce enough documentation to show that trends were demonstrated over a period of five years, ten years, whatever, then I don't think it'll be a problem. I think it's actually going to be a very positive public issue rather than something negative. Our industry is more known for people not liking us rather than liking us. I think that this is actually going to be a plus, a positive, if I can prove it; talk to me in five years.

MR. GEORGE: It's axiomatic that if the thrust of this is focused on things over which people can exert control by making wise lifestyle choices, it'll be received popularly and positively by consumers. If it's focused on things over which people have no control, it's arbitrary. Then it will be perceived negatively by consumers, because it will be out of their hands and thus perceived as being arbitrary. I hope it will be focused on things over which people have control, such as tobacco; the quintessential topic over which people have control. People have never been held down and forced to smoke against their will.

FROM THE FLOOR: Age 50 for standard class insureds is probably equivalent to about age 45 or less in the U.S. population at large. You could try rating people as the equivalent U.S. population age, and that would make them all feel great.

DR. KUSHNIR: Why not just rate people according to the average population—age, rather than according to what we price them?

FROM THE FLOOR: It wouldn't work but if you had someone who is age 50 normally for insurance purposes, say to the person, "You're age 43 according to the U.S. life tables," which is probably true for an age 50 standard issue insured.

