

## **Dean Goldschmidt's Interview with Ralph Sacco, M.D.**

**Monday, March 30, 2009**

**PJG:** Thank you very much for taking the time and listening to some of the questions and providing us with answers to things that I know a lot of people would like to learn about you. You have been a fabulous leader for the Department of Neurology at the University of Miami for the past two years -- going on three years now. It has been a pleasure and an honor to be working with you and seeing how, so elegantly and effectively, you have taken on the leadership of the Department and really, already contracted great programs. A few days ago we also found out you will be the next president of the American Heart Association, and you are the first neurologist provided with that responsibility and honor. And so, I thought it would be a wonderful opportunity for us to chat and hear about your career. I was really amazed that from the very get-go of your career when you started to do research, I remember your first paper, I believe it was published in 1982 and it was actually on a study that you did on the Framingham Heart Study, looking at the stroke outcome. Can you tell us more about it because I think that was a sign of things to come for your career?

**RS:** Well, thanks first for inviting me to be at this interview. It is actually two years—April 1<sup>st</sup>—makes two years to the day in being in Miami. I still carry the little sign you gave out, I think one of the first weeks I was here, that said, “Speed Limit 155.” Some people say, no you’re really going at 200, but it’s been great. You know it’s funny you mention that article because when I started my neurology residency, that article came out, and that was an article that was delayed...that one or one other one had just come out and a couple of people came to me and said, “Oh is your father a neurologist?” and I said, “No, why?” and they said, “There’s a Sacco

that just published an article ...” and I said, “Oh, oh—that’s me.” It was as a medical student that I’d started working on that. And to this day, mentorship which is always so important, I believe, to getting people started in careers in academic medicine, that time as a medical student, which really was between my first and second year of medical school as part of a summer clinical research rotation, I started working with someone who subsequently became a mentor for life and that’s Phil Wolf. He was one of the founding members out of Framingham, and so that was work that I had done as a medical student, continued to do with him through my medical student time and led to a publication on survival and recurrence post stroke in the Framingham Study. That was also before the days of computers, so it was done in the basement of the Framingham Study Project sorting computer IBM cards. There’s not a lot of glory sometimes in doing the actual clinical research and you’re down there with the cobwebs and spiders, sorting computer cards in the basement of the Framingham Study, but it was a great opportunity to start and actually it was funded by an AHA student scholarship.

**PJG:** Amazing. Already then, your laboratory was really your patients and the wonderful information that they provide related to blood pressure and diabetes and other vascular diseases, and how smoking and all these factors actually meld to create a risk that can be evaluated and measured to characterize their chance of developing the dreadful consequences of a stroke -- one of the most dreaded conditions of all the human diseases.

**RS:** Right.

**PJG:** So then you were already doing your residency...did your research drive your career choice, or did your career choice drive your research?

**RS:** That’s always an interesting question. As an undergraduate I was an electrical engineer, so I liked the nervous system and modeling neurons, but I probably would have gone into

neurophysiology as an electrical engineer. So I think I gravitated a little bit toward neurology, but wasn't sure about stroke. Meeting Phil Wolf, getting involved with stroke—stroke became early on an important interest, but I still wasn't sure and I actually entertained cardiology for a little while. Of course, as somebody interested in neurology, you think about neurosurgery, but then it was pretty clear that I liked dealing with patients. I liked talking to people when they were awake rather than working with them when they are under anesthesia, and I knew I wanted to be someone who would be more involved in clinical interaction with patients and also involved with clinical research more than the time a surgeon can sometimes have for research. So I think it kind of came together and towards the end of my medical student time, neurology seemed to fit. Then when I started neurology, I had an opportunity and a connection with another mentor, who was very important to me -- J.P. Mohr, who is one of the big leaders in stroke, was at Columbia, and I quickly began working with him and that solidified my interest in stroke.

**PJG:** Fascinating. And so, another interest came very early to you and that was the differences—so we all know that we are 99.9 percent genetically identical to each other, among humans. There is only 0.1 percent of our genes that actually differ, so very early on you were interested in that difference that exists between various groups, either you can classify them as ethnic or racial versus cultural. When did that interest come to you? Was it very early on that you developed an interest in these human differences that may affect propensity or susceptibility, for instance?

**RS:** Well, it's hard to think exactly where the specific interest came from. It was clear that there were differences in the mortality from stroke, and what was known was that African Americans had twice the mortality from stroke. I think the other thing that became clear was

when you have a population laboratory, which is how I describe the kind of work I do, you have to go with what's the laboratory around you and the laboratory for Columbia University was a race/ethnic mixed population. Hispanics were a large part of that population as well as African Americans, and it was an ideal kind of environment for beginning to address a question that you couldn't address in other places. Framingham could never address the question of race/ethnic variation in stroke or even cardiovascular disease; Northern Manhattan could, so the question was there, the environment was right and my interest in trying to explain variation in disease across different public health groups started, but now has grown, as you say, to include genetics because even though it's only 0.1 percent that differs between us, there are huge disparities, partially due to environment, partially due to genetics and differences in cardiovascular and stroke risk.

**PJG:** Yes, I know. It's extraordinary. So what was the kind of "big wow" that you had in your research career when really you found something that not only would surprise the world, but even surprised you when you discovered it? What was the biggest time of your research?

**RS:** The biggest wow ... that's a tough question. You know, I'm very methodical, so usually you think about things in advance and it's hard to think about a wow. Some of our big findings were obviously the first description of the greater incidence of stroke in Hispanics, who had to that day not really been investigated. So one of our first publications in the *American Journal of Epidemiology* showed that Hispanics (and our Hispanics were mainly from the Dominican Republic) had almost a twofold greater incidence of stroke and so that was kind of a breakthrough. I think some other big ones for me were our alcohol findings. I may not have been the first to describe it, but it's still one that gets a lot of energy at a meeting and the idea of drinking a certain amount of alcohol being protective. I'm still not clear exactly the reason why,

but drinking up to two drinks a day actually reduced your risk of stroke and that was an article that we published in *JAMA* and I was proud of.

**PJG:** And it's a wonderful study. And how about that [one you wrote on walking](#) every day, that was really a major impact on stroke.

**RS:** Right, physical activity, which we don't emphasize particularly in people over certain ages. This was a population ~~that the~~[with](#) mean age ~~was~~ 68/69, and just being physically active, and here physical activity wasn't like you running a triathlon, it was just walking and that was actually protective.

**PJG:** Leisure walking, right...?

**RS:** Leisure walking ... those who did some walking compared to those who were very sedentary and didn't do anything, not even walking, had a lower risk of stroke.

**PJG:** How long a walk was it, do you remember?

**RS:** At the time, I think our questionnaire, we used a validated questionnaire regarding physical activity measurement in the elderly, and it was, "Yes, I do some physical activity," and then we ranked all these different activities and the most frequent activity was walking. We tried to find out about the duration, nowadays they say 30 minutes a day on most days, back then I don't think our questionnaire actually had enough detail to isolate that.

**PJG:** Do you think it could have something to do with the ability of humans to relax a little bit? I mean, we know how important blood pressure is for the risk of stroke and one may wonder, a little glass of wine, a little walk...

**RS:** Right, right...

**PJG:** There is almost a pattern there.

**RS:** That's a very interesting thought.

**PJG:** Folks need to relax more.

**RS:** Well, when we tried to look at stress, which is one of the articles we published in a lower impact journal, because stress was not significantly associated with stroke risk, but it was how we measured stress — there is a specific geriatric social adjustment scale, and over the last six months you grade all the different activities, including something very stressful like a death in the family to something great like even getting a new job, but that still causes stress for some and we compared all these stressful activities and stress, as measured with that score, didn't show a difference, but it may just be our ability to measure stress. The idea of physical activity and alcohol leading to more relaxation and possibly reduced hypertension, which is one of the big risk factors for stroke, is a good one, but in both of our studies we controlled for hypertension as well, and still found these protective or deleterious relationships.

**PJG:** Because a lot of humans associate, and I see it -- people talk about social drinking, but actually it's a way to deal with the stress of being in an environment where there are a lot of humans and for many people, associate a certain level of stress.

**RS:** Right.

**PJG:** So I think that little shot of whiskey or glass of wine is a way that many people use to actually find themselves a little bit more on the relaxed mode.

**RS:** That's interesting.

**PJG:** And for the cardiac side of things, while we know that excess alcohol can lead to heart failure, it is clear that a little bit of alcohol has been also associated with less heart attacks and I always wonder if that could be—some people are able to do yoga or meditation, or very significant activities or mechanisms to really reach a state of relaxation; most humans actually

don't study that much, and take whatever comes and whether it's a walk with the dogs, which [in some cases](#) can be very stressful...or

**RS:** That's an interesting thought.

**PJG:** ...other mechanisms—whatever works. I mean, I think that's basically what people try.

**RS:** You know as physician-scientists, we always are thinking about the chemical in alcohol that may be protective, resveratrol for example in wine or something else or the increase in HDL, but we lose sight of these other mechanisms that could go through stress and it's probably just because our ability to measure them is not as precise, but it could be part of the reason.

**PJG:** About substance, one thing that always struck me is the fact that ~~good~~[blood](#) lipids are not risk factors for stroke, yet medications that reduce lipids, in particular the statins, reduce the risk for stroke. How did you deal with that in your thought process?

**RS:** Well, I mean the first thing is that lipids overall, especially when you just look at total cholesterol, have not been as strong of a risk factor for stroke, but they are, in some studies, a partial risk factor. The problem with stroke is it makes it difficult to study; it's very heterogeneous. Some strokes are due to small vessel disease, which may have less lipid relationships, some strokes are due to large vessel disease, particularly carotid or intracranial stenosis, have strong lipid relationships, and some strokes -- cardio embolic -- may have plus or minus relationships with lipids. So if you look at lipid relationships by specific stroke subtypes, you do find some strong associations. The second thing is we were able to show in our Northern Manhattan study that HDL was protective. Higher HDL did lower your risk of stroke, which even opens up, I think, other avenues in the future for looking at medications that may alter HDL. As for the statin effect in cardiovascular and stroke trials, their effects seem greater than

the epidemiological association between lipids and stroke. So that's why there may be other beneficial effects of statins including anti-inflammatory.

**PJG:** Yes.

**RS:** So another big area of research that we started working on was that inflammatory mechanisms may be related to stroke and cardiovascular disease.

**PJG:** Yeah, absolutely. Now, brain vessels are much more subtle than heart vessels, in particular heart arteries for example, and as cardiologists we can do anything we want to coronary vessels. They are so resistant to injuries that frankly we really have to do something very unusual to make a ~~heart~~-cardiac artery bleed. Brain arteries are much more sensitive and much more finicky when it comes to risk of rupture and bleeding. I mean, we saw recently this wonderful individual having a dreadful accident skiing and having probably what was a slowly progressive epidural bleed that led to her death. I am just wondering, what's your general philosophy relative to brain arteries and why they are so much more susceptible to injuries it seems?

**RS:** Well, I think part of the vascular disease that occurs in the brain tends to involve small vessels, and these small vessels, whether it's what we call lipohyalinosis, where they can get occluded or actually develop these microaneurysms in the small vessels, increase the propensity to bleeding. The other thing is, I think the brain is less resistant than the heart to ischemia. When the brain gets ischemic, the neurons die pretty quickly and only recently we found that some can regenerate through stem cells. But when ischemia occurs in the brain, it quickly leads to ischemic infarction and irreversible injury. The heart can be a little more resilient, but you're right about brain vessels and I believe it's probably the effects of hypertension and small vessel disease that makes bleeding, specifically, a little bit greater in the brain than you see in the heart.

**PJG:** In Natasha Richardson's case, you agree that it was probably an epidural?

**RS:** The autopsy did show an epidural.

**PJG:** Usually we describe it as something within an hour or two hours of the accident, somebody, for example, falling in a staircase and hitting their head on the wall or something like that, is usually relatively fast because of the intensity of the bleeding. Some people never wake up after an injury. In her case, it seems that she was awake and aware and with a little bit of a headache, but nothing more.

**RS:** Right.

**PJG:** Then it took a while before ... is it just because it was a small vessel, do you think?

**RS:** Well, that's a good question. I don't know the exact answers, but I know that for an epidural, it's arterial bleeding usually and it usually is rapid. That's the difference between an epidural and a subdural, where a subdural can be venous bleeding and an epidural can be arterial bleeding. You know, whether in her case she had a little bit of the injury, went home—or went back to the hotel and then began to develop the headache, did she take a lot of aspirin because she had a headache, could that have increased the risk of bleeding later, in the same injury, did something else happen later—a secondary injury. You're right, if the injury at initial injury caused the arterial bleeding, you'd think she would have lost consciousness sooner rather than hours later.

**PJG:** It's very unfortunate, but leaves such a puzzle to try to reconstitute exactly what happens to someone like that, and for someone who, [like me](#), is an extremely fervent amateur at skiing.

**RS:** Are you wearing a helmet now?

**PJG:** I definitely will think about it! And of course, being the chairman of a department of neurology, we talk a lot about stroke, but you have to deal with all aspects of neurology. I mean,

neurology includes diseases as ~~multiple~~-complex as Alzheimer's or Parkinson's or Guillain-Barré. It's an amazing panoply of disorders that involve anything from the smallest nerves in one of the extremities to degenerative disorders that affect the brain in a way that is irreversible. How do you keep that remarkable diversity of illnesses together within one department? And you do it extremely well.

**RS:** Well, thank you. I think that's just kind of ~~been~~-an exciting challenge for me and also ~~been~~-the exciting reason why I decided to move beyond a division director for stroke. I had made it clear that coming here I was not going to just focus on developing a really strong stroke program — I wanted to think about the whole department: neuromuscular disease, multiple sclerosis, Epilepsy, Parkinson's disease and movement disorders, sleep, and Alzheimer's. So we have developed a strategic plan for the department that looks at all aspects of neurology, recognizing that South Florida and beyond needs high quality neurological care. So we have been focusing on developing all parts of the department, which has been an exciting time, and to me the best part is getting other -energetic builders to embark on this journey with me as you really develop the department. So we brought Cynthia Harden, who is a tremendous asset for developing our epilepsy division. We have recruited Kristine O'Phelan and Hal Mangat to develop neuro critical care, to deal with Guillain-Barré and some of those devastating neuro critical care illnesses, including epidurals and subdurals and traumatic brain injury in our critical care unit. We also strengthened our neurointerventional program and recruited a neurologist trained in endovascular procedures, Dileep Yavagal, to work with Drs. Heros and Sultan in Neurosurgery. We have also recruited other faculty to strengthen our Sleep program both at the VA and UM. We have also created a whole new division of General Neurology to provide clinical and education support for our residency. Our residency program has been a major

enhancement with now the second largest in the country and under the new leadership of Richard Isaacson who I have appointed as my Associate Chair for Education we are continuing to enhance the educational mission. We have an active recruitment process for division director for multiple sclerosis, which is a big area. We have added to our movement disorder group by recruiting a really ~~young~~, energetic, young imaging-interested researcher from NINDS, Fatta Nahab, who has joined the movement disorder group. We've obviously pushed in aging and dementia with the formation of the McKnight Center for Age-related Memory Loss and the recruitment of Clinton Wright to be our scientific director for the McKnight Center. Since patient-oriented research has been an interest of mine, we have emphasized expanding this area in the department. We have recruited Tatjana Rundek to develop our clinical research division and help train other faculty and fellows. We are continuing to foster the development of the strong basic scientists that were here and created a new position, an associate chairman for basic research, Miguel Perez-Pinzon. So I have tried to think more broadly. I don't want to just think stroke, I want us to be, in our strategic plan, in the top 15 neurology departments in the country.

**PJG:** Absolutely, and of course when you came, one of the programs that interested you was the program at The Miami Project to Cure Paralysis, to look at individuals with spinal cord injury. What other area of the department when you first came struck you as really interesting in terms of the work that is being done?

**RS:** The basic science group in the department is phenomenal and this department had probably one of the longest running cerebral vascular basic laboratories for many years under Myron Ginsberg, in the past, and now under Miguel Perez-Pinzon. So there's a strong pre-clinical development in cerebral vascular ischemia, ~~so~~ that to me is a strong part of the department. Carlos Moraes and Antonio Barrientos are doing terrific work in mitochondrial

disease, which actually even brings in some of genetics. So basic science was strong and is continuing to develop and hopefully if we get them even more modern day laboratories they will be even stronger. I think the other area that I have tried to at least develop the department in, and there are three key areas and these areas are largely due to the investment that you've made in the medical school; one is genetics, and I think we have great opportunity to develop collaborations with the Miami Institute for Human Genomics, for Alzheimer's, for multiple sclerosis, for stroke and ~~cardio~~other vascular diseases affecting the nervous system, and for multiple neurological diseases, and working with Peggy and Jeff has been terrific. As I bring in new people, we are trying to say, "Where can we align ourselves with working in genetics?" The second has been imaging and I have been trying to bring in more people who will use the imaging tools that are on the campus to push the clinical research mission. And working with Andrew Maudsley and the group that he is beginning to develop with MR spectroscopy, functional MRI, and other structural imaging I think is great because imaging gives us a wonderful view of how the brain works. The third I think, which we are still a little behind in, is stems cells and I think we have a great opportunity with Josh Hare and the Interdisciplinary Stem Cell Institute and I would love to see a neuro stem cell person, which I know ~~is~~ in his strategic plan, he has a place waiting for neuro stem cells. But recently, Dileep Yavagal, working with Josh Hare, was one of the ones selected for an interdisciplinary grant and it's dealing with stem cells in acute stroke in a dog model. So I think we have great opportunities for further development and expansion with some of the terrific basic and clinical research leaders on this campus.

**PJG:** It's really remarkable the way you have integrated the work of your department with what is happening across the campus. Perhaps one of the examples of what you are doing ~~that is~~

~~related to~~ the McKnight Institute, a formidable effort in the area of age-related cognitive decline and memory loss and the specific area that the McKnight Foundation is focusing on. You mention Andrew Maudsley and his work with spectroscopy, which is really the only way that scientists have been able to do biochemistry on a live tissue essentially, with the analysis of markers of certain cells. Can you tell us a little bit about that area of research? It's really totally astonishing when you hear about it.

**RS:** Andrew has just been terrific. I mean, he is very focused and he is probably one of the world leaders in MR spectroscopy research and I didn't even know he was here when I came, and it was great to meet him. He has been working with our department in traumatic brain injury and has some interesting findings regarding early correlations in MR spectroscopy findings with traumatic brain injury, mild traumatic brain injury, and neurocognitive deficits on neuro-psych testing. So we are trying to develop further research in traumatic brain injury. He also has certain findings in ALS, which we normally think is a motor neuron disease, but there are findings in the brain in the cortical spinal tract and other areas that he can see ~~in~~-where looking at early changes that may occur with MR spectroscopy. We're trying to work with him with the McKnight Center which, I think, again is a terrific opportunity for us to develop ~~in~~-looking at ~~both~~-structural, functional and physiological brain imaging. His interest, of course, is in the physiologic measures and his way of looking at metabolic changes in the brain, and ~~can~~-we can couple them with structural changes, which ~~is~~are sometimes delayed, and then functional, which we can look at in people with age-related memory loss. So that's been one of the big areas with McKnight.

**PJG:** ~~And~~ I was wondering, when you then look at a field that has been a little bit of the ~~extreme~~paradigm, if you will, in neurology which is epilepsy, a condition where individuals all

of a sudden develop these tonic-clonic activities of the muscle and are extraordinarily scary for people witnessing such a crisis, and which we also associate with certain treatments that have been applied to neuropsychiatric disorders. ~~m~~My understanding is that we are pretty much in the area of epilepsy down to focusing on one pathway within the brain tissue that if neutralized completely, can ablate the tendency for epilepsy, which is really astonishing. For somebody who saw, when I was young, a movie on a patient with epilepsy, I was terrorized by it.

**RS:** Right, it is scary, isn't it?

**PJG:** That's major progress.

**RS:** It's amazing, and for example the ability to now do surgical therapies with stereotactic, very precise surgeries; we can functionally map the brain, the neurons that are the triggers, and really go in to alter those generators for epilepsy in someone, that can make a huge difference, as well as improved medications. We have ~~remarkable~~~~incredible~~ unmarkable medications and genetics is also paving the way for certain epilepsy syndromes that have genetic predisposition. So Cynthia Harden, her main interest has been actually in women's issues in epilepsy and she has published some very interesting relationships between estrogens, and response to therapy, and pre- and post-menopausal issues with epilepsy and that is, hopefully, an area that she will develop further here.

**PJG:** I was mentioning the impact that it has on the general population, ~~when they see one~~ and I had a personal experience with that because one day a few years ago, my wife and our then two boys were going to a location by airplane that a lot of the spring breakers would go to. I think it was to Nassau if I recall correctly, and the plane was absolutely full with screaming and joy and excitement—all these young folks are taking off for the spring break. And all of a sudden, my second son had a febrile seizure — at the time I did not know it was a febrile seizure because he

was playing and running just before it happened. We were landing when ~~it happened~~ he seized and I recall that the kids were screaming when we landed and I took my son while he was still seizing and I walked through the aisle when we were landing and the rows of kids seeing my son immediately became silent, and when I say silent, I mean silent. When the flight attendant saw me coming, she first jumped up saying, “You have to sit down,” and then she realized what was going on and she became pale as your coat and asked me what she could do. I asked her to get ~~some-an~~ ice and water ~~bag~~ just to try to cool him down a little bit, and it was very traumatic and it just happened in seconds. I mean his temperature, really within two minutes, shot up so fast — there was no way medication could prevent it from developing, but it was so very traumatic. ~~It’s~~ ~~made me see~~ also allowed me to appreciate the impact of seizure on the population. Anyways, I was mentioning it as a personal experience, and I hope that we continue to make progress in this area because it is really scary for the parents.

**RS:** Sure, sure.

**PJG:** Talking about childhood, can you tell us a little bit about how you grew up and how you became the man that you are? How did you decide to become a doctor?

**RS:** That’s a good question. I knew science and math were always strengths of mine, and I had an aunt who worked in a doctor’s office, and she would always tell me, “Oh you should be a physician, oh you should be a physician,” and I always asked, “Why?”

**PJG:** What’s her name?

**RS:** Aunt Dottie. And she always felt that, I guess from her perspective, some of the independence, obviously some of the financial security, but the ability to really help others through health care -- these were some of the things that she instilled in me at an early age. But I was the oldest of five, both parents had not gone to college and came from an Italian family

where there weren't that many people who had gone to college, and there were no doctors in the family—more people interested in sports rather than academics. My grandfather used to be a great supporter of academics and he'd say, "For every A you get on your report card, I will reward you with a couple of bucks, or something." So he knew about incentives, you know, even back then, and so these were people who had an influence on me at an early age to study hard, actually, and try to make a difference, and the rest I guess is history.

**PJG:** It's amazing. And you have always been such an organized individual. I was also struck by the fact that you actually write the guidelines for the management of stroke for the country and the world. I mean, you are authoring the AHA and Stroke Association guidelines. Can you tell us how that works? It's such an important part of the things we do, because that is essentially the standard that everybody has to adopt, if they want their practice to be adequate.

**RS:** Evidence-based guidelines are important, as you know, for everything we do with improving the outcomes of our patients. My role as chair of the secondary stroke prevention guidelines writing committee was the guideline you are talking about, that we published. Somebody actually told me this, I don't know if it's true, that I am the number one cited author in stroke. A lot of it is probably due to that one guideline paper that gets a lot of citations, but these are important papers. So I was chair of that committee and then helped do that, and as you know being a dean, there's a lot of politics involved too when you get a group together this large to really decipher the evidence and make guideline recommendations, particularly when the evidence may be partially conflicting in certain areas. So it was a great opportunity to be involved, and it was a huge group to work with, to work on those guidelines. Now, of course, they are getting redone and a new chair is involved, and I've moved on to another position, but

I'm still involved with the committee. These are important committees for making recommendations in the way we practice every day.

**PJG:** And if I recall correctly, you wrote the guidelines for 2002 and 2006?

**RS:** Right. In 2006, I was on the secondary ... I also was on the TIA guidelines and then I was on the primary stroke prevention guidelines as one of the co-authors.

**PJG:** And if you don't mind, I would like to ask you, when you are dreaming, what do you think could happen to the field in the way that people would really be able to stay away from stroke in most of the cases and live a life without that extraordinarily brutal disruption in their life that stroke can create?

**RS:** Well, I think that's the key—dreaming of preventing the illness. I mean that's why I am so excited about the American Heart Association, excited about their new mission of building healthier lives free of cardiovascular disease and stroke. This idea of prevention is so critical. So I guess what I envision is how we can take the information we have now, harness some of the new information, hopefully from genetics, to first improve prediction and then improve earlier prevention of cardiovascular disease and stroke; it is critical. And there is a lot we know now and we still don't do well enough, as you know, the treatment of certain conditions, but now we start things earlier and earlier. The whole new strategic plan for the AHA is going to involve a whole new pillar of what's called “optimizing cardiovascular health,” and thinking about optimum health and thinking about health factors, we'll call them, as opposed to risk factors to really start us focusing earlier and earlier on the healthy behaviors that we don't pay much attention to.

**PJG:** I have to ask you because high blood pressure is such an often unrecognized and unknown risk for stroke; if I recall, it is at least perhaps even with another risk, the greatest risk

that people can be affected with that leads to stroke. The problem, of course, with high blood pressure is that a lot of people live with it without knowing they have it. So can you tell us what people should do? It's really critical, as you say, to intervene early and to make sure that the problem is managed effectively from a very early stage. So, what do you recommend?

**RS:** Certainly, the first thing is you're right, hypertension is probably the biggest what's called modifiable risk factor for stroke and the lifestyle things that we all know about, but don't think enough about, are the things we need to focus on to even prevent hypertension from occurring in the first place. So, of course, the physical activity that we talked about—how important that is to reducing blood pressure, keeping weight down, avoiding the obesity, not smoking, drinking the right amount of alcohol — those things are key. And trying to have the right diet, including the new guidelines with lower sodium; there may even be newer guidelines coming out regarding fruits and vegetables in our diet. And then people need to have their blood pressure checked. They say 50% of hypertension is controlled, and then 50% is uncontrolled, and then almost 60% of people don't know they have high blood pressure.

**PJG:** That's the problem.

**RS:** And when you think about the huge numbers -- so how we detect it, how we get people to get their blood pressure checked, how we even redefine it. The old rules of 140/90 — does that mean that if you are 139/89, you're not at risk? Well, hypertension or blood pressure is a continuous spectrum just like weight, and we need to be thinking about getting ourselves lower on the curve as much as possible and we don't make ourselves hypotensive to reduce our risk.

**PJG:** Right, that's absolutely true. And you were talking about the benefit of very low, moderate consumption of alcohol, but too much alcohol can lead to hypertension — high blood pressure.

**RS:** The right amount of alcohol is key.

**PJG:** It's really very challenging to find the right balance. But in general, it seems that people don't realize enough that controlling your weight and engaging in serious physical activity every day can lead to a substantial reduction in blood pressure. It's really impressive to see how it works.

**RS:** You are a role model in this. I remember you kept telling me, "Make sure you get physically active ... you're going to take on these new challenges ... make sure you exercise every day!" And you're not the only one; others have said that to me recently, so I'm trying myself to be more physically active.

**PJG:** Good for you.

**RS:** You're right, physical activity is so underemphasized, the childhood obesity epidemic that is out there. We spend too much time in front of computers and in front of television sets and not enough being physically active, and I think that if we can make that one change in our society, that could be a major impact on all of these other things that lead to chronic disease.

**PJG:** Absolutely, and it's amazing. We were talking about ending epilepsy by destroying that pathway, but if we could eliminate the pathway that makes us prefer to take a cab to go three miles rather than walk three miles, you and I would probably not have a job anymore.

**RS:** That's true. That would be a nice thing, if cardiovascular disease and stroke were lower, but we will always have roles.

**PJG:** And, of course, what is very important in the work that you do is to make sure people also recognize the signs of stroke. Sometimes it's a transient ischemic attack, which is totally reversible, and that may be the last sign that something really bad is coming, and so emphasizing the recognition of these symptoms is really critical and I know you are doing a lot of work. I

know the president of the American Heart Association gives a keynote lecture, and so what will be the topic that you will focus on?

**RS:** This morning actually, on the elliptical, I kept thinking in my head, “What would be my theme?” I think it will have to be more toward the prevention side. I keep thinking how we can really be thinking differently, thinking more innovatively about prevention and kind of moving the mission of the AHA; not to say, we’re not going to forget the core mission, which is of course dealing with cardiovascular disease and stroke, but how we move the mission to a broader, expansive, across-the-life-span mission of prevention. I still haven’t gotten all the details in my head, but that obviously will be something I will emphasize. I have a little time yet -- it’s not until November 2010.

**PJG:** I think that there is so much that you have done, what would be really fascinating with medicine becoming more global ~~is-are~~ these differences that you have found between the different groups of individuals in terms of susceptibility -- it’s really absolutely remarkable. I just want to express my gratitude to Aunt Dottie for what she has done for us by recommending that you ~~become~~ a physician. I personally owe a lot of what I’ve done to my uncle Yves, who was a nuclear physicist and really was my inspiration for doing things that had to do with science. He always told me, “You know, if I had to do it again, I would do medicine and biology,” and I thought, wow, if this guy, who clearly is an amazing brain machine, tells me I should do medicine and biology, I should listen. We’re very lucky for having these individuals to tell us what to focus on. We had Match Day about a week ago and, as you know, our students did very well. It is something extraordinary in March of 2009, when the world is challenged by an extraordinary crisis in our economy, to have 169 students graduating~~who~~ and all have a job starting July 1<sup>st</sup>. We have to be humbled and certainly grateful for the extraordinary opportunity

to be given a job like that; no matter what is going on in the world, there will always be a need for great physicians and great nurses. And you, my friend, are certainly a leader in the field of medicine. We are so lucky for having you here and I just want to take this opportunity, on behalf of the University of Miami and the Miller School of Medicine, to thank you for what you do and for the wonderful aura that you bring to our medical school and to our University; and for all the people you help every day stay away from stroke, and who may or may not know your name or what you do on their behalf — to thank you for what is really an extraordinary life accomplishment that you have created.

**RS:** Well thank you, and thank you for all the support. I am excited about what we are doing now and what we are doing in the future and I'm happy that I have this opportunity to do it. What drives me, I guess, is my career and the excitement and the ability to make a difference.

**PJG:** I can't wait for the next chapter—so looking forward to it. Thank you very much.