RON: I'm going to pass controls over to you, Dan.

DAN: Okay.

RON: Yeah. Here we go. Okay. We're in. Here we go.

DAN: Okay. Do you…so you guys should be seeing my screen. So it's Insulin Resistance.

RON: I see it perfectly.

DAN: Good and I say hello to everyone. Hey, did you guys notice that Ron is a little bit dyslexic? He had me writing a book in 1969 instead of 1996.

RON: No kidding!

DAN: That was amazing! I was in high school in 1969. I'm really glad to talk to all of you. Insulin resistance, here it goes. It's a really big topic. In fact, it's arguably the most important topic in the world today, the developed world. Insulin resistance is responsible for more chronic incurable degenerative diseases than any other single metabolic problem. In fact, there is an increasing evidence that we will see as I go to this presentation that insulin resistance is being linked to Alzheimer's dementia. That is a huge deal because if you look at the number of Americans and globally, but let's look at America, individuals that have Alzheimer's disease and if it's linked to insulin resistance, we realize that Alzheimer's has the potential to cause bankruptcy in any nation because of the number of people coming down with it and the cost of caring for these individuals.

Apparently, the number in our country right now is around 5.2 million. It is expected unless we die soon within our lives that it will hit over 15 million Americans who will have Alzheimer's all at the same time. And if you look at the cost I put in this presentation, I've learned about Bloomberg Business this week where he says the cost is roughly a hundred grand per person per year. All one needs to do is take 15 million multiplied by a hundred thousand dollars and you're in for trillions of dollars.

Bottom line is insulin resistance is in fact linked to dementia, these are huge issues and huge problems. If you look at studies that have just come out this year, for example earlier this year, a study came out where they looked at a 188 countries in

our planet. A 188 countries and incredibly none of them got thinner in the last 30 years; every country became more obese.

Studies coming out just a month ago from the Centers of Disease Control continue to show that America is continuing to get bigger and bigger and this is direct consequence of being insulin resistant. Consequently we should know as much about insulin resistance as we can, particularly, the way I organize my thoughts--the consequences, the causes and the solutions and to put a face to the talk, this is me, relatively recent, about a year ago and as Ron said, I'm old. I started clinical practice in 1978. I'm a part time faculty at a chiropractic collage Life Chiropractic College West at the San Francisco Bay area where I teach one class called The Management of Spinal Disorders. I'm board certified in chiropractic orthopedics.

Just to start talking about insulin resistance, just take a look at this book here. This is one of my two top favorite books. My other favorite book is in the talk as well. Primal Body, Primal Mind by Nora Gedgaudas, out of Portland, Oregon. If you look at this book, she starts talking about what ages us and again I did this article review thing that I've done for 16 years. And an article that I just put up few months ago, I found an article from the journal Clinical Anatomy on Aging of the Disc, the intervertebral disc, disc degenerative diseases. It says what's aging the disc, what makes it go bad and if you read that article out of Clinical Anatomy, it says it is a process called glycation, the abnormal hooking up of sugars to proteins. When the sugar attaches to the protein of the disc, the disc proteins no longer function appropriately. Specifically, they no longer bind water appropriately and they become dried out and desiccated as we see when we have the MRI imaging that we see the radiologist put the word desiccation in there, the same process that ages the disc, ages our entire body.

As Nora Gedgaudas says in the very first line there, "glucose is what ages us". That's an unfortunate choice of words when she used the word glucose only because if you jump down two sentences is that fructose is 20-30 times more glycating than glucose. Hooking up, when you read the comment in the middle there from her book page 126, glucose in the blood streams forms crosslinks with proteins

called advanced glycosylation end-products. The hooking up between a protein and a sugar makes the protein not work appropriately. If it's the protein your disc, the disc doesn't work appropriately then it starts to dry out and degenerate but the same process is what ages all of the systems of our body, our brains, our skin, our arteries, our other joints , joints that don't have necessarily have a disc. That this hooking up between sugars and proteins called glycation or called advanced glycosylation end-products, this is what really ages us. Consequently, the more sugar that we put into our bodies, the more we glycate and also these sugars are directly linked to that phenomena known as insulin resistance.

Who says that insulin resistance is the most important health problem in the world today? Well, this cross section of books that I just put into the notes, we'll do this starting with Fat Land: How Americans Became the Fattest People in the World by Greg Critser in 2004. You read this book; the villain in the book throughout the book is fructose. As Gedgaudas said in the page before that fructose is the primary thing that glycates us and ages the different systems of our body.

This book here Good Calories, Bad Calories by Gary Taubes arguably the top science writer in obesity in the world today. I've recently seen not only the books that he's doing but he had the cover article in the political magazine Newsweek. He's recently had a great article in Scientific America. He's recently had an article in the BMJ, the British Medical Journal. All talking about the physiology of fats. Bottom line, again the most important health problem in the developed world today is insulin resistance. Gary Taubes did a great job in this book however, I don't know that it's for all of you. Only in that, it's 600 pages of physiology. It's a fabulous book but he wrote another book in 2011 that might be an easier book to start with if you like his 2011 book that I would maybe go back to this one but it's a fabulous book on topic insulin resistance is the most important health problem that the developed world faces.

This book here, End of Overeating by David Kessler. Kessler is former FDA Commissioner for Bill Clinton and George Bush. He wrote this book in 2009 which again the central theme of this book is that the most important health problem in the

world today is insulin resistance and part of the reason is carbohydrates are addicting. They create morphine-like molecules that create an addiction just like other things can cause addictions like heroin and cocaine and methamphetamine or whatever. We acknowledge those products as being addictive but carbohydrates also create morphine-like molecules that create addictions which is why it is so difficult for people to stop consuming the carbohydrates. One of the consequences of habitual consumption of carbohydrates, of carbs, is increased risk of insulin resistance.

This book here, The World Is Fat by Barry Popkin, the big nutritionist at the University of North Carolina Chapel Hill. I will not read this to you but just kind of letting you know that it's the same basic message coming at 2009 but what he also says in here is he gives probably the most simple solution I've read and he says we can handle obesity and insulin resistance by doing just one change in our daily habits and that one change is drink only water. He says in his book that your average overweight American consumes 760 calories per day by drinking sugary junk. Consequently, and all that sugary junk is directly linked to insulin resistance and the health problems that go with. Problem solved. Drink only water. Drink nothing with sugar in it. By the way, some of you seen the study that just came up a month ago in the journal Nature. It is very well supported in this book 2009 and that is that the solution is not drinking diet sodas. The fact that they are now acknowledging that diet sodas are also causing insulin resistance and increased risk of becoming diabetics is pretty interesting news. But just sort of letting people know that diet sodas are not the answers. You got to go back, diet sodas are part of the problem; they're not part of the answer.

Primal Blueprint by Mark Sisson 2009 is an excellent lay person book. Again, central theme the number one health problem in the world today in the developed world is insulin resistance. This is a book that anyone can read, a layperson to professional and the really good thing's this is a type of book that a professional would give to patients or siblings or parents or children because it's very very readable and I think he did a terrific job in this book.

Sugar Nation by Jeff O'Connell coming out in 2010: I think he's the editor of Men's Health or some similar magazine. Great book. Central theme again is on insulin resistance. Reading this book, I learned so much good stuff. I got a much better understanding of Hemoglobin A1C. Hemoglobin A1C is a measure of one's glycation and again being a marker of our risk of insulin resistance and also diabetes.

The Sugar Barons by Matthew Parker: kind of a disgusting book but very informative. My recommendation is don't read this book but if you like these topics, read National Geographic August of 2013. Just go to your local library. National Geographic 2013 has a wonderful article on sugar that covers much of the same stuff here about how people exploited the addictability of sugar centuries ago; and what it meant for the human race. Very very well done this book but it's a book, if you want a reader's digest version, you can go to national geographic, similar message.

Again, there's a lot of money to be made in sugar. Why? Because if you put sugar in any food product or drink product, any, people will consume more of it. Since people that want to make money by selling people more stuff - you put sugar in it they are going to sell more, they are going to make more. But this is not necessarily good for the health of the individual or for the society at large as people get insulin resistance and multiple chronic incurable degenerative diseases that are directly linked to insulin resistance and why we have to kind of understand these principles and garner physiology against them.

Wheat Belly: the great book coming on 2011 by William Davis. By the way, he has another book. Just got it, haven't started it yet. I just finished a book on Magnesium which was fascinating but his second book will be my next book. I learned so much reading this book by cardiologist William Davis. I think it's a book that all healthcare providers - all healthcare providers should read this book. Lose the Wheat, Lose the Weight, and Find Your Path Back to Health. Again he talks about the genetic manipulation of wheat by Norman Ernest Borlaug, getting the Nobel Prize for his efforts in 1970. But how when you genetically manipulated the wheat, you increase its glycemic index where he calls amylopectin A. When you have an increased glycemic index and when you expose your body to this on a repetitive basis, you

increase the risk of becoming insulin resistant and diabetic and what this does to human health and physiology. A fascinating book. Very well done by a guy that's quite credential.

Taubes' second book, Why We Get Fat, And What to Do About It: again Taubes, is top of his game. Top science writer this moment in history. I think the world of the guy in terms of writing this information. This book is much easier to read than his prior book from 2008 Good Calories, Bad Calories. Consequently if any of you are into these topics, I would read this book before I read his 2008 book. Both are fascinating. This is a great message.

This book here, Why Calories Count, pretty much similar message by the great nutritionist out of New York University, Marion Nestle. She's the lady that's in the media a lot, when they interview for different news programs about nutrition, a lot of times they tend to talk to Marion Nestle. She's in the printed press quite frequently as well. I like her a lot. I like this book. Again, central theme insulin resistance is a big problem and diet sodas are not the solution.

Heavy by Richard McKenzie, 2012: The Surprising Reason America's The Land of the Free and The Home of the Fat. He really does a great job talking about insulin resistance, particularly some of its relationship to the consumption of grain products.
The Skinny Rules by Bob Harper. I just did classes last week in it Wichita, Kansas. One of the guys said he did this and he lost 35 pounds in relatively short period of time. I forgot the time frame. The Skinny Rules is a very, very simple read. Bob Harper is currently is on television. The greatest, The Biggest Loser, I guess. I've never seen the program but the rules here are very, very simple. Again they're simple rules that we would get anyone that we believe wants to avoid insulin resistance nicely.

But this one comedian, no doubt. Kick Your Fat in the Nuts by T.C. Hale. Again the central theme by the book is insulin resistance and there's a lot of information I'm sharing with you is coming from these references. This was funny from the beginning

to the end. He's definitely a comedian and I think it was a really easy book to read to get the same message.

The Fat Switch by Richard Johnson. Paradox of a guy, he is a nephrologist in Denver, Colorado. Kidney doctor and yet he writes the book from the perspective of a biological anthropologist. He talks about why we get fat, what are the factors. Once again, we have another book that says not only is insulin resistance the biggest problem in the developed world today but that the primary culprit in this is fructose. He is particularly negative on fructose that is void of vitamin C and void of fiber. He says if you have both vitamin C and fiber then the deleterious components of fructose are mitigated but if you have things for an example high fructose corn syrup that you have fructose without the vitamin C and fiber and what it does to the human health and physiology. Plus he does a wonderful job thoughout human history. So he does multiple animal species talking about how they got fat. The similarities of why humans get fat and then a review of human history on obesity and gouty arthritis. He looks at how fructose is also not only the driver of obesity, but also gout and what you can do to avoid it. I put a really great graph together at the back of this presentation based upon on this book that we will review I hope before my time with you is up.

Salt, Sugar, Fat by Pulitzer Prize winner, Michael Moss, 2013. This is an incredible book. The basic theme of this book is how carbohydrates in particular, that's why sugar is in the middle of this title, carbohydrates are addicting. If you put sugar into anything, people will consume more of it as already noted. If you take sugar out of things, people will eat less of it. Consequently, they tend to put sugar in everything and they know based upon functional MRIs and PET Scans that what is required to get people addicted to food products that are deleterious, mainly these food products will get people insulin resistance and we're seeing the consequence of that in our country and other places in the world, our country. We saw the article by Christopher Murray coming up last year from memory, August 14th the 2013, Journal of the American Medical Association. They say that in over the last 20 years, America's health has dropped significantly yet health care costs are going up and yet our health as a country is going down representing roughly 3 trillion. We're not healthy for that 3

trillion that we're doing. Why? Because we get addicted to things that are truly bad for our physiology and we get addicted unusually often in utero or as infants, then we continue these habits throughout our lives.

This book here is an eye opener for anybody who wants to understand why the smartest scientists don't work for NASA. They work for the food companies and their goal is to addict us to products that are largely bad for our health. Wonderful book. This is one of the greatest books of last year. Fat Chance by pediatric-endocrinologist from UC San Francisco Robert Lustig 2013. This talks again the central theme of this book is that insulin resistance is the most deleterious healthcare issue in the developed world. He uses different metaphors. He says, once he uses the superman metaphor, he says the Lex Luther of this story is sugar. Another one he uses the Sherlock Holmes metaphor, he says that Professor Moriarty of this story is sugar. Sugar is the problem because it causes insulin resistance and all of the downstream health issues that goes as a consequence of that including obesity and eventually diabetes, dementia, etcetera are all downstream consequences of the same insulin resistance phenomenon. This is a wonderful book that I believe in my heart everyone should read and people tell me that he's got wonderful videos in the internet which I've not seen but people tell me they're kind of long with a little over 40 minutes but they're wonderful for those of you that are not readers. I'm a reader so I like reading and I thought that this is one of the best books I've ever read.

A lot of the things from the book is that… this book coming up also last year David Perlmutter, I'm a fan. He's written about 5 books or so. I read all of them. I've not met him. Claiming to be the only board certified neurologist and board certified clinical nutritionist. This book here is over the top interesting. Look at the words under the title, The Surprising Truth about Wheat, Carbs and Sugars: Your Brain's Silent Killers. He did a great job here talking about insulin resistance and refined carbohydrates and they're linked specifically to grains but to other products as well. One of my all-time favorite books coming out last year. For a moment, last fall one year ago, this book was the bestselling book in both America and in Canada. Something that rarely occurs, Dr. David Perlmutter was able to accomplish that.

One is insulin resistance using these references. These are some of the things that I have learned. And some of this is somewhat rude, sorry about that. Here's the rudeness. One is insulin resistant when your waist circumference is bigger than your butt circumference. When your waist is bigger than your butt it's pretty obvious to everyone staying that around you. In fact when Dr. Michelle Schaer and I are in airports together, we can just sit there and count people walking by and see out of ten people that walked by how many visibly have tummies that have bigger than butts. It is roughly 7 out of 10. The official number of people are now that are insulin resistant in our society is 69%. One of the markers is tummies tend to get bigger than butt. When you're insulin resistant, you tend to store visceral fat and bellies tend to get bigger than butts. They say that the best, you should be below a 1:1 ratio. In other words a 1:1 ratio is the upper limit of acceptability. Optimum for a man is 0.8 meaning your tummy is 80% of your butt. Optimum for a woman, little bit tighter is 70%, 0.7.

There are other markers of insulin resistance. These are out of these references including Perlmutter's book Grain Brain. You want your fat, if you're fasting glucose is greater than 95, sometimes people say a hundred. Perlmutter says no, it's 95. If your fasting glucose is about 95 milligrams per deciliter, you're insulin resistant.

Also, glycation is routinely being measured in our patients today as hemoglobin A1C. He says if you're above 6% that you are insulin resistant. There's so many problems associated with high blood glucose. For example, I was showing people this last weekend in Wichita, Kansas a study from the Diabetes Journal by a guy named Kong, K-O-N-G like Kingkong. Kong, K-O-N-G. He… in that article they say for every 1% your hemoglobin A1C goes up, your risk of cancer goes up 18%. This is because cancer fuels itself primarily through anaerobic glycolysis which uses glucose. When you're doing sugars all the time and you're insulin resistant, you can't get that sugar out of the blood stream. The result is it feeds the cancer cells with great efficiency. Consequently, watching your glycation, your hemoglobin A1C. An ideal range is also in the literature as well but I see something from a study that's very well done by Jeff O'Connell in his book Sugar Nation, it's also well done by David Perlmutter in Grain Brain and it is to do with your fasting insulin levels because what O'Connell and

Perlmutter say is that a lot of people have normal fasting glucose and normal hemoglobin A1C but the only reason they're normal is because their pancreas is working overtime which is measured by fasting insulin levels. So that should do the first two without fasting insulin is shortsighted. Shouldn't do that but you want to know what your fasting insulin is; the lower the better. Fasting, you certainly do not want it above 8 but ideally you would be not above 3. The units for fasting insulin is kind of interesting, microinternational units per milliliter.

The consequences of being insulin resistant, the classic consequence is obesity which talked about in every facet of contemporary society. You become prediabetic and eventually you become diabetic, hypertension, artery disease, cancer, arthritis, pain. The pain context is really interesting because when you're insulin resistant, the body doesn't use insulin very well so the pancreas responds by increasing the production of insulin. Insulin interestingly up-regulates the Delta 5 desaturase (D5D), which controls the conversion of linoleic acid into gamma-linolenic acid which means bottom line, when you are--have insulin resistance in you, the body produces more insulin. You accelerate the proinflammatory cascade towards prostaglandin E2 towards proinflammatory eicosanoid hormones so there's a pain connection to the insulin resistance.

Then I put enough first studies in your notes on how insulin resistance is driving Alzheimer's and other neurodegenerative diseases. The Alzheimer's one is kind of how I started this short webinar. The Alzheimer's one is very interesting and it in fact it calls, we will see from the Journal of Alzheimer's Diseases that just came out saying, "Hey, this looks like it's a real connection that there are huge consequences to being insulin resistant."

Lastly, the autism one: I have an article from a couple years I go that I put into my article review service that says if a mom insulin resistant at the moment of conception that one of the problems of being insulin resistant is trouble making adenosine triphosphate, which is why you have so many links, you know, like pain and Alzheimer's etcetera because you have trouble making ATP. But because babies need ATP to make synaptogyrin of the brain. They found that if the mom is insulin resistant at the moment of conception, since she shares the blood with the

baby at least initially that the babies will have net lower levels of ATP trouble making the synaptogyrin in the brain increasing the risk of Alzheimer's in the babies by 61%.

So put that one in my article review service out of a pediatric journal, quite fascinating stuff but there's so many deleterious consequences of being insulin resistant. What are the causes? Well first off sugar but when you say sugar, when you say the way of sugar to professionals and particularly into the lay people, their immediate big concept is white table sugar which is half glucose and half fructose. Both of which are problematic but there is a lot of press today, particularly if you read Fat Chance by Robert Lustig, the pediatric-endocrinologist from UC San Francisco, University of California San Francisco. He's adamant that the worst of the worst is fructose and the reason is fructose not only causes insulin resistance, fructose also cause leptin resistance. As he says, leptin is the key to understanding obesity, the key to obesity epidemic. He says that when you're leptin resistant, your brain no longer knows when you are full and you tend to overeat.

And then if you read both The End of Overeating by Kessler, one of the books we saw; as well Salt, Sugar, Fat by Michael Moss. They both say when you feel hungry, you go forage. Proven using functional MRIs and PET Scans, you go for combinations of salt, sugar and fat. The result is you get leptin resistant because of the fructose, you tend to eat more stuff and that more stuff tends to make you even more insulin resistant which puts you into negative feedback loop. I guess it's actually a positive feedback loop that's going in the wrong direction. So fructose because people say, "What about honey? What about agave?" I don't know. The evidence says that these are not good products because they're pretty much devoid of vitamin C and fiber and they are more likely to cause both leptin and insulin resistance as well.

We know that refined carbohydrates, I mean you read, I just read an article on Lebron, James, the great basketball player from Miami now transitioning up to Cleveland. They are looking at some of the diet changes that he's doing and they find that athletes can pretty much tramp all their best measures of prowessness by avoiding the consumption of carbohydrates.

Some of you might have read the book The Paleo Diet for Athletes by Loren Cordain (2005) from Colorado State University. These are fascinating references. What they point out is refined carbs include potatoes, rice, pastas, breads. The things that are often the base of the food pyramid for a professional athlete are actually deleterious for a lot people. Even our own government claims that the basis of our diet to be healthy should be grains and yet grains are considered a refined carbohydrate. Read Grain Brain by Perlmutter. Read Wheat Belly by William Davis. You kind of get the point. But these refined carbs have lots of deleterious consequences in human health and physiology. All foods with a high glycemic index are most problematic. Trans fats are bad because they screw up, they gum up the insulin receptor which helps to make one insulin resistant. We know that the sensitivity of all the receptors of our body are based upon a balance of our omega-6: omega-3 ratios and that your typical American is way way too high in omega-6 which stiffens up the receptors so it doesn't work very well.

A book that is not in this presentation, The Schwarzbein Principle by Diana Schwarzbein, a physician-endocrinologist from Santa Barbara, California. It's a wonderful book on insulin resistance and even diabetes. She talks about the solutions being get people to stop doing the refined carbohydrates and balance the omega-6: omega-3. Your average American is so low on omega 3s that we not to do a blind test for all of our patients to see the ratio of 6:3. It's a very simple and cheap finger prick blood analysis. We see with the ratios are; we go with what the literature says. You never want to see that ratio greater than 4:1, yet the average American is now 25:1. The result is this increases the risk of insulin resistance and all kinds of diabetic, chronic incurable degenerative diseases.

I remember in 2011, the article by Artemis Simopoulos, physician-geneticist. Female, because Artemis can be either be man or woman. It's a female. Artemis Simopoulos as she wrote an article in the Journal Molecular Neurobiology in 2011. She says, if you want your brain to work right, the ratio of omega-6: omega-3 cannot be above 2:1. I mean it's a pretty tight line there but if you start thinking, if you get people that are coming at 10, 15, 20, 25, 30:1, you realize that this is really bad for them and their brain makes every part of the body insulin resistant including the receptors of

the neurons in their brain having trouble making the appropriate quantity of ATP to run the glutamate and the sodium pump, etcetera.

The wheat connection from Wheat Belly by William Davis, I mean who would think that wheat, even whole wheat. People think it's health food, it's not. Read Wheat Belly by William Davis and the consequence of consumption of amylopectin a.

Then the book on Alzheimer's Disease by Mary Newport. It's coming up. You guys will see it momentarily on how ceramides create insulin resistance in your brain. This is horrible for human brain. The risk of Alzheimer's and how ceramides, these toxic fats create insulin resistance in the brains, are directly linked to the amount of alcohol we consume and things that have nitrosamines in them which are, you know, your nitrates which are typically you know salami, baloney, and bacon and sausage and all that stuff. But the evidence says they now put nitrosamines in flour. So the result even when you do white flour products like a bagel, who would have thought you get increased exposure to the ceramides creating insulin resistance in your brain. Solution: specific to the cause - stop consumption of all that sugary junk, other refined carbs that you don't consider sugary like potatoes and pastas and rice and stuff like that. You got to watch out for wheat and other things. There are different nutrition products that work really well without poaching a brand name.

Look at the third one down. You have to balance your omega-6: omega-3. If you don't do that, most of what we do is moot. There's a lot of evidence that cinnamon just as a component of something you would do throughout a normal day, in your tea or coffee or whatever, cinnamon sharpens the sensitivity to the insulin receptor.
Chromium, lots of studies show chromium sharpens the sensitivity of the insulin receptor. You got probably at least 200 micrograms today. Some study say you might have a thousand micrograms, would be 1 milligram. No trans-fatty acids. Exercise is an excellent way to increase the sensitivity of the insulin receptor and help people to protect themselves against insulin resistance.

And alternative sources of adenosine triphosphate, if you are insulin resistant can be very very well done and the most classic without going ketone acidosis from couple

of studies, I put in a few notes is the consumption of medium chains saturated trigycerides aka becoming a consumer of coconut oil. Not only is that done in the good book Coconut Cures by Bruce Fife in 2005. It's been very well done in Alzheimer's book by Mary Newport 2011 and most recently the Wahl's protocol for treating Multiple Sclerosis and other autoimmune diseases does a great job of plighting the value of coconut oil as a source of medium chain saturated triglycerides for the backdoor of the electron transport chain making ATP energy way more efficiently than sugar ever thought of doing and some of the ways that you can change the metabolism of how you make energy and becoming less dependent upon refined carbohydrates.

Then of course things like stopping your alcohol, stopping your consumption of the sources of nitrosamines. Just kind of look at the second group here. Usually when we do sugars they're in disaccharides. So if you look in the second group there. I guess I can point them out using my little hand here. I don't know guys if you can see them or not. We have sucrose which is common white table sugar. It's kind of a really bad because it's glucose which gives you glycemic response. It has fructose which gives you leptin resistance. Pretty much a 50:50 ratio.

Lactose, the stuff you get -people don't understand this - they will never do half and half but they will do heavy cream. Half and half has lactose in it as in other milk products. Lactose is half glucose, half galactose. Don't talk about galactose too much but glucose, the more glucose that goes in your body the greater the insulin response and the higher the probability, you will become insulin resistant.

Then well deserved, beer belly. Maltose, sugar in beer. Maltose is a glucose, glucose doubling the glycemic index compared to sucrose and lactose and just kind of cruising through this, looking at this little section right here in this picture here. What insulin does and this is what Taubes talks about. Taubes is good, he did a really good job on both of his books. This is primarily out of Good Calories, Bad Calories.

When you put insulin into your blood stream because it's not being used appropriately, you're insulin resistant. You increase, you up-regulate a gene that makes it protein. The protein on the right is called lipoprotein lipase. Lipoprotein lipase opens the door to a fat cell so the circle that you're looking at here, this is a fat cell. When you open the door to a fat cell, you take the energy and you just shove it into the fat cell. At the very same time, the insulin up-regulates another gene that produces a hormone called hormone sensitive lipase which is lipase, -ase means it's enzyme, all enzymes are protein comes out of our DNA. This molecule closes the door to fat cells. So what happens is when your insulin is high you just put, you just store energy into the fat cells. You can't get it out.

The solution is dropping your insulin which means you have to stop consuming refined carbs. You get contemporary society, your average American way more than the average. The large majority, the vast majority of Americans they are consuming glycemic high things throughout the day. They have glycemic high meals and they snack glycemic high between meals. The result is their insulin levels stay high all day long constantly opening the door to the fat cells pushing the stuff into the fat cells with no ability at all to pull the energy out of there.

You got to drop your insulin levels which is all of these contemporary studies on go as long as you can between eating, don't eat carbohydrates after dinners. Some are saying like T.C. Hale, don't eat carbohydrates after the middle of the afternoon, keep your insulin low because when you get your insulin to a certain level, you reverse this and you shut the door that puts stuff into the fat cells, you open the door to get the stuff out of fat cell, you burn it up as a source of energy and the fat cells starts to shrink. Also very well done by Lustig, Robert Lustig, the pediatric-endocrinologist, Fat Chance 2013 copyright.

All of this is good and so I put together these graphs here. Look at the second graph, first here. Just… this is primarily out of Richard Johnson's book, Fat Chance and says you got fructose there in the middle, didn't matter where it comes from. Whether it comes from sucrose or high fructose corn syrup, sucrose is 50:50 glucose: fructose. High fructose corn syrup roughly 55% fructose, 45% glucose.

When you do the fructose, the fructose goes up equates leptin resistance. When you're leptin resistant, you're hungry, you've cravings and you got to go eat.

According to Michael Moss and David Kessler, you got to go eat something that is high in salt, sugar and fat. But also according to Richard Johnson, fructose controls the conversion of your purines which is some of the nucleotide bases of your DNA into uric acid which gives you the gout connection that he notes to our history passing book. Uric acid creates free radicals, free radicals cause damage to mitochondria. Mitochondria damage reduces the production of adenosine triphosphate. ATP low makes you hungry. When you are hungry, you will forage; contemporary times means you're hitting the refrigerator.

What fructose does in driving the system is mitigated as I said earlier with fiber and vitamin C. If you eliminate either one, you have a problem. In fact Lustig says, the pediatric-endocrinologist, he says you cannot drink orange juice. Yeah, orange juice got the vitamin C but is there a fiber? So you get this cascade and other cascades which are deleterious to human physiology increasing the risk of becoming insulin resistant. So if you go to page 1, the very first page. First paragraph of Lustig's books, he says "You can eat the fruit. You can eat an orange but you cannot drink orange juice." In fact, later in this book, he actually says that orange juice ounce per ounce is more deleterious to your health and physiology than drinking sodas. By the way, did you guys see the article two weeks ago from the American Journal of Public Health? They found drinking more than 20 ounces of a sugary soda per day is equivalent to smoking in terms of damage to your health and physiology as measured by your telomere length - both have a reduction in telomere life by 4.6 years. So in other words, sodas at 20 ounces or plus per day but if you guys look at that, eight ounces per day pretty much reduced telomere length by 2 years. Study goes 1. 9 years. Again, all of these articles I put on article review service when I see them but again the fact: why would orange juice be ounce for ounce worse than soda? Because it has more fructose ounce per ounce. Fructose as he says is the Lex Luther.

This bigger picture here, kind of a summary of everything we just did and I got pretty good at 46 minutes here. Again, just kind of go where we were. Fructose. Fructose creates leptin resistance. Leptin resistance gives you craving and hungry, you got to eat. You got to eat, it's proven using PET scans and functional MRIs. You going to eat combination of fat, salt and sugar. That all of these things together hits what the book by Michael Moss says that the bliss point which is a biological addiction, that this combination's a biological addiction, they put it in, they fine tune it, they'll get people to eat more of that stuff bad for health and physiology. The sugars can be not only sugars but also refined carbs. The glucose that puts out more insulin. The insulin gives you insulin resistance. Insulin resistance means you have trouble getting the insulin out of the blood and into the cells, remember ATP, result is you get reduced ATP. It makes you tired, it makes you lazy We also know , it's kind of what I said, but it's easy to see on our graph compared to just my words, no doubt.

Multi [neuro physiological…speaker is inaudible here] integration of loops of your hippocampus. Insulin, up regulates the delta 5 desaturase enzyme which controls the conversion of corn, soy, cottonseed, sunflower, safflower, and canola, whatever into arachidonic acid. Arachidonic acid is one step away from pro-inflammatory eicosanoid hormones lead by the 1982 Nobel Prize by Vane prostaglandin E2 which gives you pain and inflammation, degenerative joint disease and all the connections there with.

In other words, insulin in your blood all the time is not just bad because of insulin resistance, that's bad enough. But also because it accelerates the pain production pathway and inflammation, that's linked to all chronic incurable degenerative disease. I've mentioned that insulin up-regulates the production of lipoprotein lipase, opens the door of the fat cell which push all of your energy into the fat cell at the same time, it closes up the door out which is called hormone sensitive lipase which makes your fat cells get bigger and bigger and bigger and you can't get them thinner.

Just tailing it out, great book on Alzheimer's being insulin resistance in your brain 2011 Mary Newport, a wonderful physician at South Florida. Wonderful book on Alzheimer's. Another nice study here on how coconut oil as an alternative source of

fuel to feed the brain when you're insulin resistant. Great book and a great article supporting it which brings me to the end of my talk. Ron I have run now for 48 minutes and you said that you would open it up for questions. I am ready for that.

RON: Wow! Good.

DAN: How is that for a run-on sentence, you guys?

RON: That was great Dan. We do have a few questions. First question is, "Where do you get the blood prick test for the omega ratio?"

DAN: We get it from a place called Lipid Labs and there's --if you guys, if anybody wants to know, you can email my Michelle and she will email you the lab. It's a finger prick blood analysis. Everyone should get it done. Put it like this, if you don't know what the ratio is you don't know anything about your health and physiology. The most important thing to do is to balance your omega-6: omega-3 ratio and it's called Lipid Labs it called the Holman test. It's cheap, it's a finger prick. It's $70. Michelle's email address is drmschaer@cox.net Dr. Michelle Schaer drmschaer@cox.net Michelle also has--if you guys like the stuff that I just did. Be aware that there are short videos that Michelle has of me doing this that you can get from her as well. Just contact Dr. Michelle Schaer, who is my girl. She also manages the seminar schedule so you guys just email Michelle. She'll send you the lab and if you're interested in any of her DVDs just ask about it. She's happy to tell.

RON: Second question. Is it better to measure the C peptide rather than the fasting insulin as a marker?
DAN: You faded out at the front of the question. Please do it again.
RON: Yes. Is it better to measure the C peptide rather than the fasting insulin as a marker?
DAN: I don't know. I mean it think it's a good question. What I was going over is what I saw in David Perlmutter's book, Grain Brain. He as did Jeff O'Connell in Sugar Nation, they both give the tip to the fasting insulin levels. But I'm not negative on the other stuff; it's just over my education.

RON: Okay. Let's see here. Is the ceramide build up reversible?

DAN: According to the book by Mary Newport on Alzheimer's disease, wonderful book, the answer is yes. You can reverse it but you have to stop doing those things which means you have to stop eating processed meat. You have to stop drinking alcohol and you have to stop eating things that have white flour in them which anyone that's concerned about their insulin resistance has to do anyway. If you guys remember, there's that article from 2012 in the Journal of Alzheimer's Disease by Rosebud Roberts. She goes over how those that are the habitual consumers of refined carbs, including that white flour stuff increase their risk of mild cognitive impairment which is a precursor in Alzheimer's by 400%. Scary stuff. We should be avoiding all of those products anyway.

Then you look at the alcohol thing and people think well moderate regular drinking is good for you. I think that's a message of propaganda put up by people who want to sell the alcohol. I think there's definitive proof that drinking moderate levels of alcohol reduces the risk of cardiovascular disease and heart attack and stroke risk. But don't forget from memory April 2013, there's an article by Nelson in the American Journal of Public Health where they go over that the same amount of alcohol that will reduce your risk of heart attacks and stroke, increases the risk of cancer by a factor of 10s. For men it was stroke; cancer for women, they say it was breast cancer. So they say that for anyone that's at risk of cancer or actually has cancer, the only acceptable consumption of alcohol which would include those toxic fats that create ceramide is in fact zero. Just so we're clear.

RON: Okay. Thank you.

DAN: You're welcome.

RON: Let's see here. General question. Why isn't insulin part of the regular screening-- I guess I'm reading, the way I'm reading it is why isn't insulin part of the standard blood profile that's ordered by physicians? I know glucose is. Why isn't insulin part of it?

DAN: I wouldn't-- I don't know why but I think it's shortsighted; just like whoever is asking that question probably thinks it is shortsighted, and those references say it is shortsighted. Everyone should know what they're fasting insulin is. It should be part of what we all get done when we get our fasting glucose and our hemoglobin A1C.

I think it's just because there aren't many people that truly understand even the things that we went over today so it hasn't become a standard yet. But again, these books will create the standards. Just look, I mean one of the worst diets in the history of the world is the diet that is promoted by US Department of Agriculture. Why does that exist? Again, I don't know. I just know that it does and that we have to grassroots to change this. So we have to order that fasting insulin as a special test when we want it in our patient, which we want. It's just kind of the ways things are now. I don't know if they'll be like that forever but I think it is one more understanding of how human physiology is understood that one day it will probably be just a normal thing of what we do. Because we as a society cannot handle all the insulin resistance and the dementia that it is causing; not to mention the other problems that it causes. I mean when you get, when you're insulin resistant you will become obese and get hypertension so we put everybody on high blood pressure medication. Well, let's face it. That's not as costly as people coming down with Alzheimer's dementia. I mean the cost associated with being insulin resistant, I think we should have all of these tests done just done on a routine basis, including the fasting insulin levels.

RON: Okay. Thank you. I think, 2 more questions. The questions states, "I hear you should eat every 2 hours to keep your blood sugar stable. I also hear skip meals and go as long as you can without food. Both with the intent of stabilizing insulin. Please provide your opinion."

DAN: My opinion, again, if you read Jeff O'Connell, there's definitely some people for their own uniqueness that need to do frequent small meals so as to keep their blood sugar under control but as a rule, that's exceptions. The rule is I believe today you should go as long as you can.

Read, there's a great article on it just came out last month from the journal Aging on one of the best strategies to reverse and to stop the progression of dementia is to go as long as you can between meals because the goal is to get your blood sugar as low as possible and keep it as low as possible. If you read Nora Gedgaudas, I mean just for just sitting here for a second and to answer that I would just cruise all the way up to the very first page of this presentation by Gedgaudas, says, as you read down this a little bit it says aging is now being understood by people researching on longevity as essentially a gradual process of glycating all the tissue including the brain. The lower we maintain blood sugar levels, the slower this process occurs and the longer and the healthier we live and the more gracefully we age says how much insulin we produce over the course 0f our lives controls how long we live. It turns out the less insulin we need, the better. If there is a known single marker for long life as found in the centurion and animal studies it's low levels of insulin. One single longevity marker stands out amongst all long-lived animals and people above the above the rest and that's low insulin levels.

That I am not opposed to people doing small frequent meals to keep their insulin at certain level but as long as that level is as low as they physiologically can without hurting the physiology. So again, some people need it different but overall we should probably go without eating as long as we can like for dinner no food after dinner till breakfast next day. Gives us an easy 12 hours, let's just say 7 to 7 where their insulin gets low because that's then it helps us so we are less insulin resistant and that we can access the energy to our fat cells. In fact, last year, the book came out The Fast Diet arguing that Paleolithic human did not have food every day and that there were times, sometimes went a whole day without eating and to fast like that changes the sensitivity of the insulin receptor and it benefits our health throughout our entire lives.

Again, I am in favor for the most part. We learn concepts, we treat individuals. If the individual needs small frequent meals because of their unique health issues then that's what we will do. But as a rule, we encourage people not to snack between meals, not to eat after dinner and to go as long as they can between eating even if it involves an occasional fast, like the Fast Diet that came out last year.

Oh, by the way just look at the last paragraph here. “Few people are aware that omega-3 fatty acids which includes ALA, EPA and DHA are easily the most efficient nutrients in the modern western diet. Insufficient intake of this vital and essentially dietary components is linked is with virtually every modern disease process.” Again, Michael Pollan 2008 from UC Berkeley, the theory of everything, the balance of 6s and 3s are critically important because it changes, it controls the sensitivity of all the receptors of all of our cells as well as our pro-inflammatory or lack thereof our inflammatory profile.

RON: Dan, one last question. We got a number of questions but is there a correlation between insulin resistance and conditions such as frozen shoulder, adhesive capsulitis, etcetera to the glycation?

DAN: I would say that the best book that I’ve read on this is a book called Fascia by Schleip came out in 2012. It’s the best book on neuro-orthopedics and his central theme is all of these fascial problems including shoulder tendonitis or whatever, all of these things are linked to inflammatory cascades which is why at the back of his book, he recommends that we live in an anti-inflammatory state and he recommends consuming ALA, EPA, DHA and GLA as well as a generalized anti-inflammatory diet because all of those inflammatory conditions are linked. If you take bread and you make a toast, how do you make toast out of bread? You add heat. What a toast is glycated bread, you can’t take it back to bread once it’s toasted. So what you add is inflammation. When your body is inflamed, that accelerates our glycation, so the rule is quit putting those crappy carbs into your mouth and stop your inflammatory profile by balancing your 6s and 3s. Then you have the least chance of glycating. Why would you glycate one shoulder versus this shoulder on the other side? Well because mechanical stress does further enhance the inflammatory cascade which would elevate the glycation there versus other spots which is the article from, by Michael Adams in the Journal of Clinical Anatomy on disc degenerative disease. Again, all of these studies if anybody likes these studies, I mean I have 16 years of articles of my article review service that anyone can access but just going to my

webpage which is danmurphydc.com. www.danmurphydc.com The dc means I'm a chiropractor and if you don't put the dc on it, you won't get there.

RON: Dan, this is a great great presentation. I really appreciate it. I know the audience really benefit greatly from what you shared with us today. But I want to thank you so much and what I'm going to do is anyone listening, this has been recorded because there's a lot of information that Dr. Murphy went over. This will be recorded. It will be available within 48 hours.

Dan, thank you again so much. Have a great great rest of the day for you.

DAN: Thanks Ron. Glad to be on it. Good bye everyone.

RON: Bye. Take care. Good night everyone. To all, good bye.