URAC ACCREDITED HEALTH UTILIZATION MANAGEMENT

SPECIALTY HEALTH

URAC ACCREDITED WORKERS' COMPENSATION UTILIZATION MANAGEMENT

WELLNESS AND PREVENTION PROGRAM

(A Primary Prevention Teaching Syllabus for Public Safety and the Rest of Us!)

E.J.G.

Insulin Resistance is far and away the most important problem facing public health today. It's the nation's 800 lb gorilla that must be addressed. Perhaps 30% of the population is affected and for public safety in Nevada, particularly, it's even more of an issue, considering the ramifications of NRS 617. (I know you all know this.)

Fundamentally, *Insulin Resistance* is a disorder of lipid metabolism. The statements of various experts may initially seem somewhat divergent and confusing to you (they were to me), but when you consider their various subspecialties the points of view become understandable as part of the bigger picture. That's one of the reasons we created the body on page 2 of the handout.

Dr. Cromwell starts his explanation of *Insulin Resistance* talking about free fatty acids leaking from the swollen fat cells. Remember, Bill is a famous lipidologist who sees complex lipid patients every day. Many of his patients are diabetic and have already had a heart attack. The insulin resistance process in these patients has long been established. Please see his 22-minute video, it's excellent and his starting point makes sense.

Dr. Lustig, on the other hand, implicates fructose in his fabulous YouTube video, *The Bitter Truth*. He is a pediatric endocrinologist thinking about the earliest phases of *Insulin Resistance,* especially in kids, and how fructose is metabolized by the liver into fat. Fructose is "handled like a fat," he says. As a pediatrician, naturally his efforts focus on the very early stages of the disease and its relation to pediatric obesity. It makes sense.

Gary Taubes might be best thought of as somewhere between Drs. Cromwell and Lustig. Gary is passionate about debunking bad science and his research into the misinformation about dietary fat comes out clearly in all of his writings. His interest is defined in the title of his book, *Why We Get Fat*. "Carbohydrates Drive Insulin Drive Fat" is a quote he likes and much of his focus is on the adult population. Again, his views make sense and we will see where they fit into the bigger picture.

My colleague Dr. Tracey Green has views very similar to Gary Taubes; they belong to the same organizations. She sees the problem through the eyes of a bariatric physician who is an expert in the treatment of severe obesity. Tracey isn't the least bit hesitant to cut carbs severely and use a ketogenic diet.

Dr. Reaven, of course, really called attention to this whole set of disorders in the first place, calling it Syndrome X in 1988. Working in the cardiovascular section at Stanford, prevention of heart attacks is a primary concern for Gerry. It's not surprising, therefore, that he emphasizes the threesome of High Triglyceride, Low HDL and High Particle Number in *Insulin Resistance* that is so critical for causing Heart attacks.

I will try to show you where all of these experts fit on the picture of the body and we will quote some of these experts in this brief "simple" handout. You will see many of the diseases of civilization together on one page, and clearly understand, I hope, that the early diagnosis and treatment of *Insulin Resistance* gives us a huge bang for our buck. We are so lucky that many of these experts have been to Northern Nevada already and that more are coming, including Drs.

Dayspring, Dall and others!!! This extremely generous group has contributed more than I can possibly list to the development of our wellness and prevention program. The program keeps evolving. Now, however, it's up to us. We need to apply this knowledge to help the *Insulin Resistant* patients we are responsible for and reverse this insidious and dangerous process. The last page will summarize for you how we are doing that as of December 2011. There is a great deal of work yet to do!!!

Please consider four questions as we look at this handout.

One: How do we recognize *Insulin Resistance* (what is the best way to identify the "silent killer", as Gerry Reaven calls it)???
Two: Why is *Insulin Resistance* so often missed, even when the data is right there before our eyes???
Three: Is treatment effective??? (Chapter 8) What must we do to reverse *Insulin Resistance*???
And finally, four: What happens if we don't treat *Insulin Resistance*???

This handout is designed to help us answer these four questions. EJG

"THE BIG 5"

Patient: [redacted]
Agency: [redacted]

Physical Date: 02/14/2010
Review Date: 09/24/2010

RISK	OBESITY	BLOOD PRESSURE	BREATHING		LIPID PROBLEMS					BLOOD SUGAR	TOTALS
	BMI	BP	Tobacco Use	Aerobic (METs)	Chol	LDL	HDL	Triglyc	Ratio	Glucose	
HIGH	>= 30	>= 140/90	Yes	<= 10.6	>= 240	>= 131	< 40	> 200	> 4.50	> 125	5
MODERATE	25-29.99	120/80-139/89	Past	> 10.6 & < 13.4	200-239	100-130	40-60	150-200	3.50-4.50	100-125	3
LOW	< 25	< 120/80	No	>= 13.4	< 200	< 100	> 60	< 150	< 3.50	< 100	
YOU MEASURED	32.4	130/78	Yes	13.6	215	109	34	359	6.32	82	2

You have 5 high risk factors.

FRAMINGHAM RISK ASSESSMENT

Age:	29
Gender:	Male
Total Cholesterol:	215
HDL:	34
Current Smoking:	Yes
Systolic BP:	130
10 Year Risk of Developing Hard CHD	
Framingham Risk Score:	8%
Score Date:	09/24/2010
Score if Cardiac or Diabetic Condition: >	

TRIG/HDL RATIO

10.6

METABOLIC SYNDROME

Abdominal Obesity (Waist):	Men >= 40 in; Women >= 35 in. or BMI >= 30	1
Triglycerides:	>= 150 or if taking medication for elevated blood triglycerides:	1
HDL Cholesterol:	Men < 40; Women < 50:	1
Blood Pressure:	Sys >=130; Dias >=85 or Patient is Hypertensive:	1
Fasting Glucose:	>=100 or Patient is Diabetic:	0
Metabolic Syndrome:	3 or More Factors Present:	Yes

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Summary:

1. You have a **8%** chance of having a cardiac event in the next 10 years.
2. You have metabolic syndrome.
3. Your risk level based on ATP III and Framingham is **Moderate.**

Insulin Resistance – Undiagnosed and Untreated

GT - GA

Associated Cancer:
Breast, Colon
Prostate, Etc.
(Insulin Related Growth Factor)

Alzheimer's
Dementia
GT - CQ

Stroke

Brain

WC

Fat → Free Fatty Acids

Carotid Artery

Muscle → Glucose and Fat as Fuel

↑ Triglycerides

↑ LDL-P

↑ VLDL (P)

↓ HDL (P)

It's not the passengers, It's the cars!
MR

Myocardial Infarction

Fatty Liver

GR- TD

Heart

Liver

Fructose and High Fructose Corn Syrup (Alcohol without the buzz) goes straight to the liver
RL

Diabetes
GT - TG

Carbs → Insulin → Fat

Pancreas

Polycystic Ovarian Syndrome
TD

Visceral Fat

Kidney

Colon

ovary

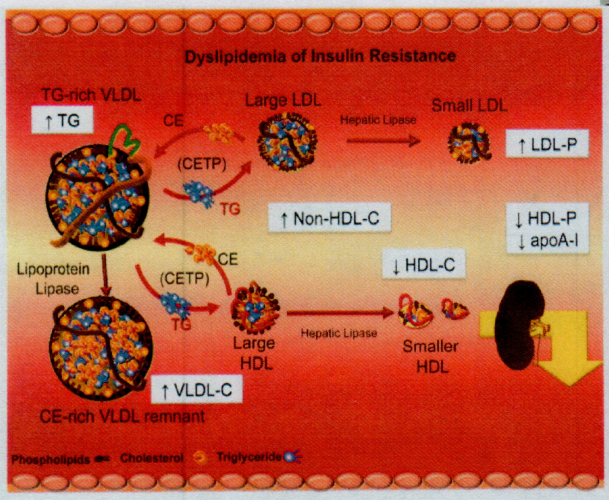
Salt Retention
=
Elevated Blood Pressure
JS

Uric Acid Retention
=
Gout
JS

Nerve Issues
Peripheral Neuropathy

Peripheral Vascular Disease

Amputation



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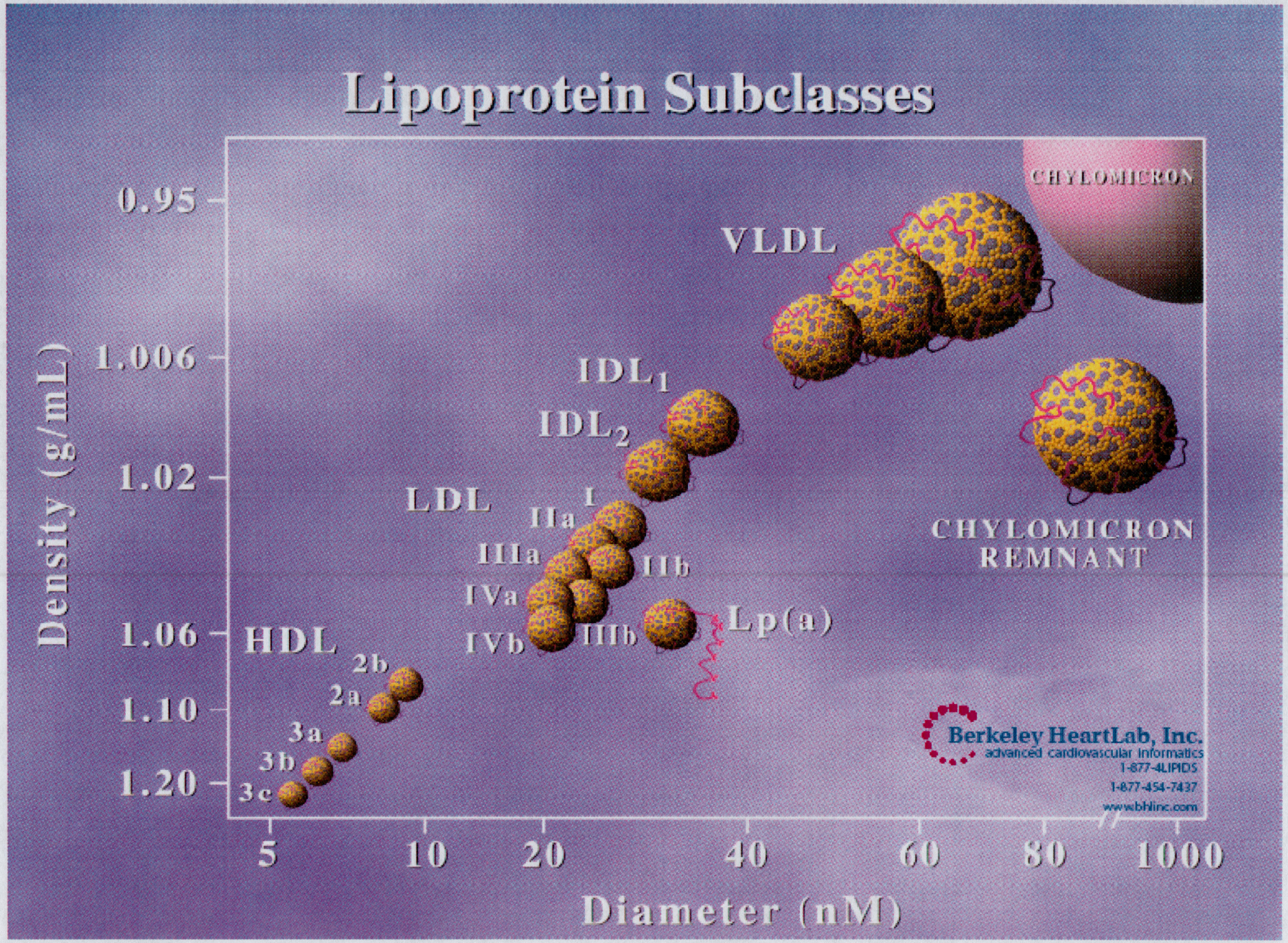
Lipoprotein Subclasses
CHYLOMICRON
VLDL
IDL1
IDL2
LDL
I
IIa
IIIa
IIb
IVa
IVb
IIIb
Lp(a)
HDL
2b
2a
3a
3b
3c
CHYLOMICRON REMNANT
Berkeley HeartLab, Inc.
advanced cardiovascular informatics
1-877-4LIPIDS
1-877-454-7437
www.bhlinc.com
0.95
1.006
1.02
1.06
1.10
1.20
Density (g/mL)
5
10
20
40
60
80
1000
Diameter (nM)

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The most forceful thing he said, the only time he raised his voice somewhat, was at the evening presentation when he said:

"In trial after trial, in five major trials, it's the particle number that always most closely tracks risk".

William Cromwell, M.D. SpecialtyHealth Wellness Workshop, September, 2011

It's not the passengers, it's the cars!

Dr. Michael Richman

Insulin Resistance occurs in the majority of the **diseases of "modern" civilization**:
Heart Attack, Stroke, Type II Diabetes Mellitus, Dementia, Obesity and some Cancers (Breast, Colon), etc.

- When humans become Insulin Resistant more insulin is required to allow sugar to enter the cell. When insulin levels are high, fat accumulates in the fat cells and can't escape to be used for energy.

- When you become Insulin Resistant it is difficult to lose weight by burning fat.

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"RECENT DATA FROM NHANES SHOWS THAT THE SINGLE BIGGEST CAUSE OF MYOCARDIAL INFARCTION IN THE U.S. IS INSULIN RESISTANCE.

IN YOUNG ADULTS PREVENTING INSULIN RESISTANCE IS PREDICTED TO PREVENT 42% OF MYOCARDIAL INFARCTIONS"

Article: **LIPOPROTEIN COMPOSITION REGULATES LDL-P by Thomas Dayspring MD ,FACP, FNLA**

Insulin Resistance as described by Dr. Gerald Reaven

- "Due to a combination of genetics and lifestyle, many of us are insulin resistant. That is, certain cells in our body don't respond efficiently to insulin's call to accept glucose from the blood. Our pancreas then pumps out extra insulin to correct this problem. Ironically, in doing so it lays the groundwork for another, equally dangerous problem: (Metabolic Syndrome), which is caused by the combination of insulin resistance plus compensatory hyperinsulinemia".
- "The cluster of problems that make up (Metabolic Syndrome)-including elevated triglycerides', low HDL cholesterol and smaller, denser LDL particles-encourages damage to the coronary arteries that can trigger a heart attack. **The best way to solve this problem is to attack it at the root that is, to keep insulin levels under control.**"

Syndrome X, The Silent Killer, Pg. 167

* We took the liberty of substituting Syndrome X with Metabolic Syndrome

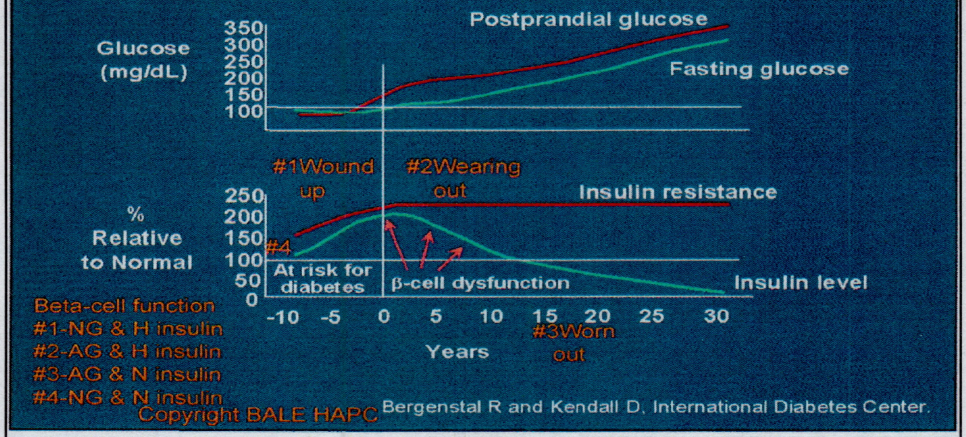
Is There A Simple Way To Identify Insulin Resistance?

- **Yes**: A blood triglyceride/HDL ratio ≥ 3.5 provides a simple means of identifying insulin resistance. *
- Insulin Resistance occurs early. It is the canary in the coal mine. (20 year IR → DM2)
- Are you Insulin Resistant??? Do the math!
- Insulin Resistance **is** reversible. (**It's our nations biggest public health problem.)**
- Primary treatment is a low carbohydrate diet.

* Tracey McLaughlin, M.D., Gerald Reaven, M.D., Etc. amjcard 2005

Measuring insulin levels helps stage course of disease and effectiveness of treatment targeting IR (#4)

Natural History of Type 2 Diabetes



An incredibly important graph.
We can see Diabetes coming 20 years in advance.

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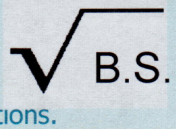
- Unfortunately, I know lots of lipid guys and gals, even certified lipidologists, who think they can look at the various lipid concentrations or ratios and very accurately guess whether atherogenic lipoprotein assays (apo-B or LDL-P) would be normal or abnormal. If I can be blunt: anyone believing that is **delusional**!
- You would be better off flipping a coin!



- That is why my patients get NMR particle concentrations.

Continued....

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- When assessing risk on the annual physicals, you need to take a look at the Insulin Resistance first!
- Then if you see red lights and bad numbers, please consider advanced testing. (DO IT!)
- The sooner we all start checking LDL-P and run away from cholesterol measurements, we can say goodbye to discordance and be more accurate at risk prediction and getting to goal!

A Tutorial on Lipoprotein Composition
Tom Dayspring, M.D., FACP

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So……how do we correct Insulin Resistance?

1. Cut the carbs (Gary Taubes, Dr. Tracey Green, Dr. Gerald Reaven, Dr. Robert H. Lustig – The Bitter Truth, Dr. Thomas Dayspring and Dr. Tara Dall)
2. Exercise (Bill Land, Dr. Gerald Reaven, Tammy Lopes, Dr. Kevin Gilmartin, Rob Conatser, Dr. Scott Hall, Dr. Thomas Dayspring and Dr. Robert Lustig)
3. Weight loss (Karen Bain, R.D., Gary Taubes, Dr. Tracey Green, Dr. Gerald Reaven, Dr. Thomas Dayspring, Dr.Tara Dall and Dr. William Cromwell)
4. Possible medications, such as Statins or Metformin (Dr. Scott Hall, Dr. Grant Anderson, Dr. Tara Dall, Dr. Thomas Dayspring, Dr. William Cromwell and others)

TREAT TO AN LDL-P OF 1000

(Do whatever it takes**!**)

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IN CLOSING

At Specialty Health, as you know by now, we see the early identification and effective treatment of INSULIN RESISTANCE as the single most important part of our wellness program. We believe that INSULIN RESISTANCE is the biggest public health problem we face as a nation. We must address this or else medical costs will only continue to escalate. A yearly physical with lipid and other basic lab work gives us our best chance to identify the at-risk patient early on. Then we can sort the patients out according to risk. Especially those at risk for INSULIN RESISTANCE are invited to participate in our wellness program. In Reno, the process proceeds as outlined below.

POLICE AND FIRE INSULIN RESISTANCE PROTOCOL

1. Appointment with Dr. Greenwald after Insulin Resistance risk is identified.
2. Have patient view the Hermosa Beach Fire video and discuss Big "5" Risks.
3. NMR and other tests are ordered as indicated.
4. Provide patient with Gary Taubes short message (Chapter 1), the primer on Insulin Resistance (Chapter 2), and The Best Case Ever (Chapter 8) as an example of what is possible. For Police, Dr. Kevin Gilmartin's *Emotional Survival for Law Enforcement* is very important along with a copy of SpecialtyHealth's Atlanta firefighter DVD.
5. Appointment with Dr. Hall to review NMR and other tests, consider medications, along with therapeutic lifestyle changes and review of Insulin Resistance information.
6. Introduce patient to a CWP advocate, such as past champions of the program, to provide insight into the program and motivate with proven results.
7. Appointment with nutritionist Karen Bain, RD for low carb diet advice. Follow-up as prescribed by Karen. (Encourage them to bring their spouse)
8. Appointment with exercise physiologist Bill Land to establish a fitness baseline and exercise prescription. This may include coaching with Tamara Lopes at American Iron Gym, or perhaps a visit with Rob Conatser at Sierra Strength and Speed, if within the patient's abilities. Follow-up as recommended by the exercise physiologist.
9. Track weight loss if weight is an issue. Arrange periodic follow ups. Don't lose them!!! Laura Lazenby to help coordinate follow-up visits. No mixed messages- everyone on the same page to bring about sustained behavioral change!
10. Medical follow-up with Dr. Hall with the goal of getting the LDL-P (the particle number) close to 1000 or less in 6 months. Access ongoing medication needs.
11. Ongoing yearly NMRs at the time of the annual physical are a must for the Insulin Resistant group to accurately track particle number. Routine labs no longer apply (discordance makes this mandatory).

THANKS EVERYBODY. We hope you found this helpful. EJG