INE INSTITUTE OF NUTRITIONAL ENDOCRINOLOGY

INSULIN RESISTANCE SOLUTION PRACTITIONER TRAINING

Assessment

With Dr. Ritamarie Loscalzo

Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

Assessments

- Assess your clients to determine if they are a candidate for blood sugar balancing:
  - Use the ***"Insulin Resistance Assessment" online form***
  - ***Lab Testing – PDF document***
  - Use the ***"Short Lifestyle Assessments"***

Lab Testing for Insulin Resistance and Blood Sugar Dysregulation - #1

Date Tested	Test	Optimal Range	Notes
	Fasting Glucose	75 - 89	Fasting glucose becomes abnormal after a long standing problem with insulin control.
	Fasting Insulin	2 - 5	High fasting insulin is indicative of a serious insulin dysregulation. Rarely done, but much more useful would be insulin after eating. In most cases it parallels blood sugar, but not all the time.
	Triglycerides	50 - 100	These are fats that have been created from excess carbohydrates.
	HDL	> 50	"good cholesterol"
	Triglyceride/HDL ratio	< = 1	This is a good marker for insulin resistance and sugar dysregulation. Ideal is when the HDL is greater than the triglycerides.
	Hemoglobin A1C	4.8 - 5.0	HBA1C is a measure of the percentage of your blood cells that are glycosalated, i.e. sugar-coated! Indicator of glucose control over previous 3 months. The average glucose level can be determined from the A1C as follows: **A1C (%) / Mean blood sugar:** 4/65; 5/100; 6/135; 7/170; 8/205; 9/240; 10/275; 11/310; 12/345. Available as a home test kit in all major pharmacy chains and online.

Lab Testing for Insulin Resistance and Blood Sugar Dysregulation - #2

Date Tested	Test	Optimal Range	Notes
	Blood Spot Fatty Acid by Metametrix	N/A	Detects imbalances in omega-3 and omega-6 fats that adversely affect insulin sensitivity and can lead to blood sugar imbalances. DHA is particularly important.
	Vitamin D	75 - 100	Improves insulin sensitivity and regulates immune system.
	C-peptide (also known as insulin C-peptide, connecting peptide)	1.1 - 4.4	This test measures residual beta cell function by determining the level of insulin secretion.
	Islet Cell Antibodies (ICA)	< 1	Antibodies that attack the islet cells of the pancreas, the cells that make insulin.
	Glutamic Acid Decarboxylase (GAD) Antibodies	0.0 - 1.5	Glutamic acid decarboxylase (GAD) is an enzyme that is produced primarily by pancreatic islet cells. GAD is an enzyme that makes GABA.
	Insulin Antibodies (IAA)	< 5	Antibodies that attack insulin.
	Adrenal Stress Index	N/A	A panel that measures the adrenal hormones cortisol and DHEA as well as fasting and post meal insulin. Adrenal stress contributes to insulin resistance.

Lifestyle Assessments

- ❑ Diet & Nutrition
- ❑ Fitness
- ❑ Stress & Attitude
- ❑ Sleep
- ❑ Timing

Symptoms of Insulin Resistance

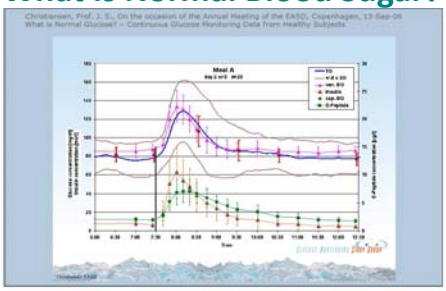
Lab Marker Patterns

	Normal	Insulin Resistance	Metabolic Syndrome	Diabetes
Fasting Glucose	75-89	90-119	>=100	>=120
Triglycerides	>65	>90	>110	>110
HDL	50-90	<65	<55	<55
Fasting Insulin	2-5	Normal or >5 – varies on stage	>5	>5
Hemoglobin A1C	4.5 – 5%	5.3-6.5%	>5.7%	>5.7%

Home Glucose Testing

- ❑ **Glucose Testing Resource Page**
  - ➢ Order or purchase your own meter
  - ➢ Practice on yourself
  - ➢ Watch the videos and download the tracking forms
  - ➢ Get your client to start testing before making major diet changes

What is Normal Blood Sugar?

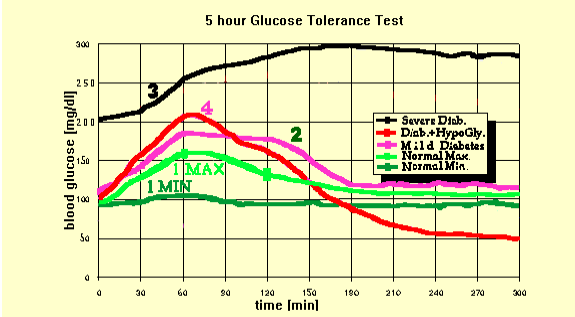


What is a Normal Blood Sugar?

Normal blood sugars after a high carbohydrate breakfast eaten at 7:30 AM. The blue line is the average for the group. The brown lines show the range within which most readings fell (2 standard deviations). Bottom lines show Insulin and C-peptide levels at the same time. Graph is a screen shot from Dr. Christiansen's presentation cited below.

What is Normal Glucose? Continuous Glucose Monitoring Data from Healthy Subjects. *Professor J.S. Christiansen, presented at the Annual Meeting of the EASD.*

Response After 100 gram Glucose Solution



Some Foods Don't Raise Glucose But Increase Insulin

- ✓ Dairy produces high insulin responses, despite low GI
- ✓ Insulin response to milk not just due to lactose
- ✓ Amino acids leucine, valine, lysine, and isoleucine are insulinogenic – highest in whey
- ✓ Protein-rich foods and foods rich in fat and refined carbohydrate elicited insulin responses that were higher than their glycemic responses
- ✓ Protein-rich foods or the addition of protein to a carbohydrate-rich meal can stimulate a modest rise in insulin secretion without increasing blood glucose

Glycemia and insulinemia in healthy subjects after lactose-equivalent meals of milk and other food proteins: the role of plasma amino acids and incretins *Mikael Nilsson, Marianne Stenberg, Anders H Frid, Jens J Holst and Inger ME Björck Applied Nutrition and Food Chemistry, Lund University, PO Box 124, 221 00 Lund, Sweden*
http://www.ajcn.org/content/80/5/1246.full

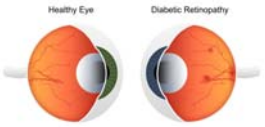
Blood Sugars Over 100 Cause Damage

- ✓ Beta cell destruction begins at levels over 100 (5.6 mmol/L).
- ✓ A small amount of beta cell dysfunction begar to be detectable in people whose blood sugar rose only slightly over *100 mg/dl* on a 2-hour glucose tolerance test.
- ✓ Every small increase in the 2-hour glucose tolerance test result corresponded to how much beta cell failure was detectable. The higher a person's blood sugar rose within "normal" range, the more beta cells were failing.

Beta-cell dysfunction and glucose intolerance: results from the San Antonio metabolism (SAM) study. Gastaldelli A; Ferrannini E; Miyazaki Y; Matsuda M; De Fronzo RA;Diabetologia 2004 Jan;47(1):31-9

Diabetic Retinopathy Develops at "Pre-Diabetic" Blood Sugar Levels

- ✓ More than 60% of retinopathy cases were among patients with fasting plasma glucose levels below 7.0 mmol/L (126 mg/dL).
- ✓ 7.4% to 13.4% of participants had retinopathy at glucose levels below 5.6 mmol/L (100 mg/dL).
- ✓ One in ten people had only abnormalities of post-meal blood sugars.



Relation between fasting glucose and retinopathy for diagnosi sectional studies Wong TY, et al *Lancet* 2008; 371: 736-743.
The Patterns in which Diabetes Develops