INSTITUTE OF NUTRITIONAL ENDOCRINOLOGY

INSULIN RESISTANCE SOLUTION
PRACTITIONER TRAINING
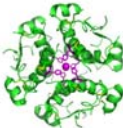### Overview
With Dr. Ritamarie Loscalzo

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.

What You Will Learn

✓ What insulin resistance is and **how it develops**

✓ How to detect insulin resistance in your clients years **before conventional medicine would catch it**

✓ The **long-term consequences** of unmanaged insulin resistance

✓ The **5 most important early screening tests** for insulin resistance

✓ The **5 most important steps** to restoring insulin and blood sugar balance

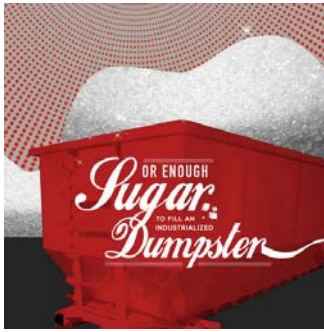✓ The **5 most important nutrients** to balance in order to restore insulin receptors

The Staggering Statistics

✓ As of 2011, 18.8 million people in the US diagnosed with diabetes (approximately 8.3% of US population)

✓ Diabetes is the 7th leading cause of death in the US

✓ Diabetes cost $245 billion in 2012

✓ Insulin resistance estimated to affect 1 in 4 in the US – about 68 million people!

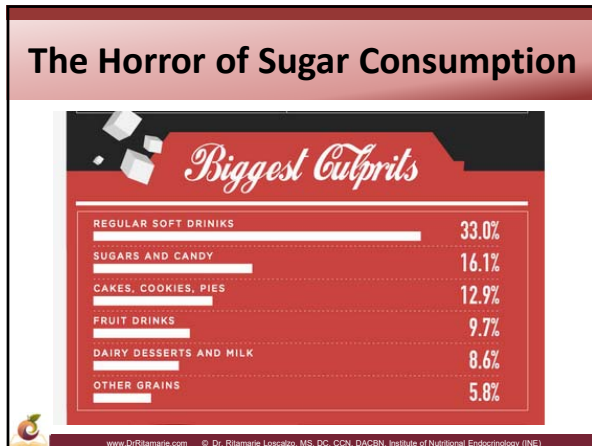✓ Average American consumes 130 pounds of sugar a year, more than 22 teaspoons per day for adults and 32 for children!

http://www.drritamarie.com/go/SugarStats

DIABETES

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US Sugar Consumption

OR ENOUGH *Sugar* TO FILL AN INDUSTRIALIZED *Dumpster*

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Teaspoons Per Day of Sugar

AMERICA HEART ASSOCIATION RECOMMENDATION:
NO MORE THAN
9.5 TEASPOONS
PER DAY

THE AVERAGE ADULT: **22** TEASPOONS PER DAY

THE AVERAGE CHILD: **32** TEASPOONS PER DAY

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The Horror of Sugar Consumption

Biggest Culprits

REGULAR SOFT DRINKS	33.0%
SUGARS AND CANDY	16.1%
CAKES, COOKIES, PIES	12.9%
FRUIT DRINKS	9.7%
DAIRY DESSERTS AND MILK	8.6%
OTHER GRAINS	5.8%

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Normal Blood Sugar Management

- ✓ Involves **pancreas, liver, adrenals, and brain**
- ✓ When <u>blood sugar gets too high</u> – insulin released
- ✓ When <u>blood sugar gets too low</u> – glucagon released
- ✓ Influenced by **genetics**
- ✓ Impacted by **stress**
- ✓ Affected by **diet**
- ✓ Shaped by **lifestyle**

Raises Blood Sugar
High blood sugar promotes insulin release
Glucagon stimulates breakdown of glycogen
Liver
Pancreas
Insulin stimulates formation of glycogen, stimulates glucose uptake from blood.
Tissue Cells (muscle, kidneys, etc.)
Lowers Blood Sugar
Low blood sugar promotes glucagon release
Chemistry involved in normal regulation of blood sugar

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Normal Insulin Response to Food

Eat

Hunger → Blood glucose rises

Increase in energy as glucose converted to ATP ← Pancreas secretes insulin

Pancreas stops secreting insulin ← Insulin escorts glucose into cells

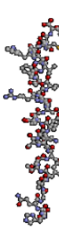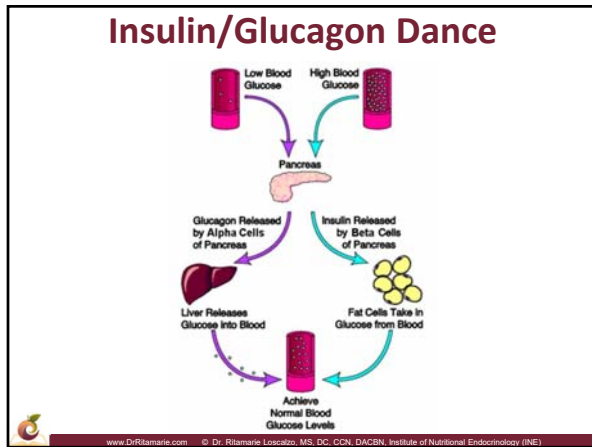Leptin levels rise and trigger fat-burning ← Blood glucose decreases

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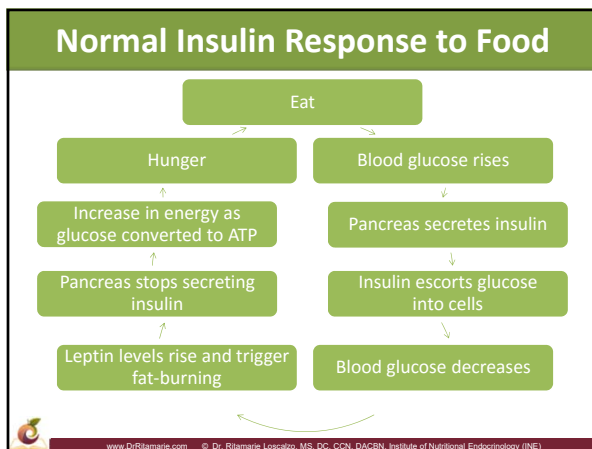
Normal Blood Sugar Regulation

Between Meals➜

➜ Decreased blood glucose

➜ Pancreas secretes glucagon

➜ Glucagon triggers lipolysis (fat cell breakdown)

➜ Glucagon triggers gluconeogenesis - liver glycogen

➜ Blood glucose rises

➜ Under extreme energy demand, glycogen is depleted and cortisol and adrenalin are released

➜ Adrenalin triggers lipolysis; cortisol triggers gluconeogenesis – muscles break down
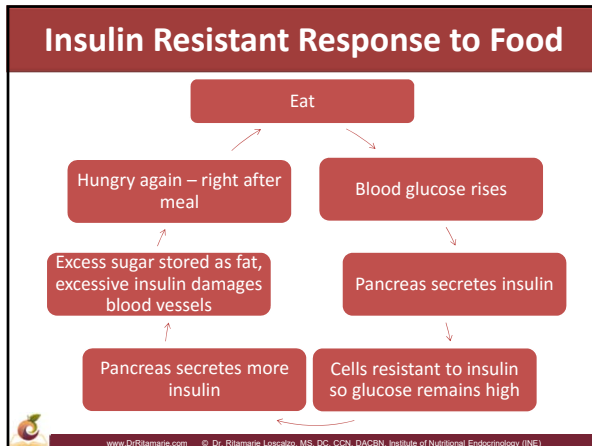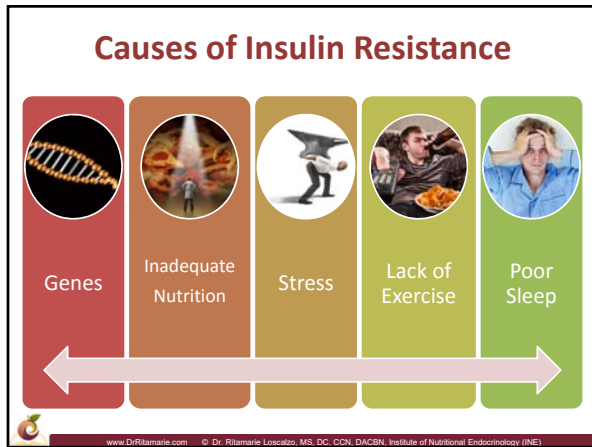
Insulin/Glucagon Dance

Insulin and the Brain

✓ **Old Thinking:** Brain doesn't need insulin

✓ **New Thinking:** Insulin plays a significant role in the brain

✓ Insulin receptors in high concentrations in the

  ➢ Hypothalamus

  ➢ Cerebellum

  ➢ Hippocampus

  ➢ Cortex

Insulin Resistant Response to Food

Eat

Hungry again – right after meal

Blood glucose rises

Excess sugar stored as fat, excessive insulin damages blood vessels

Pancreas secretes insulin

Pancreas secretes more insulin

Cells resistant to insulin so glucose remains high

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Causes of Insulin Resistance

Genes | Inadequate Nutrition | Stress | Lack of Exercise | Poor Sleep

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Going Deeper With Causes of Insulin Resistance

✓ **Genetic predisposition:** By age 60, 40% of Americans have at least 3 markers and 60-70% have at least 1 marker

✓ **Omega-3 deficiency:** DHA (docosahexaenoic acid): ⇑ Omega 6:3 ratio or trans fats in cell membrane

✓ **Nutrient deficiencies:** Chromium, magnesium, zinc, B vitamins and possibly boron and lithium

✓ **Exercise deficiency:** Lack of resistance exercise, manual labor, trained muscle mass

✓ **High insulin requirement foods:** Sugar, processed foods, starches, fruit juices, and soda

✓ **Stress:** Hypercortisolemia and inflammatory cytokines

✓ **Protein:** Insufficient or malabsorption

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Symptoms of Insulin Resistance

Belly Fat	Low Energy (especially after meals)	Hungry (even after a full meal)	Mid-afternoon Energy Slump	Difficulty Focusing	Cranky and Irritable if Meal Missed

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Early Detection of Insulin Resistance (Dysglycemia)

- ✓ Home Glucose Monitoring
- ✓ Hemoglobin A1C
- ✓ Stealth Lab Analysis Techniques
- ✓ Waist to Hip ratio > or equal to 0.8 in a female or equal to 1 in a male or waist > 35 inches
- ✓ Symptom Survey

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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.

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Response After 100 gram Glucose Solution

5 hour Glucose Tolerance Test
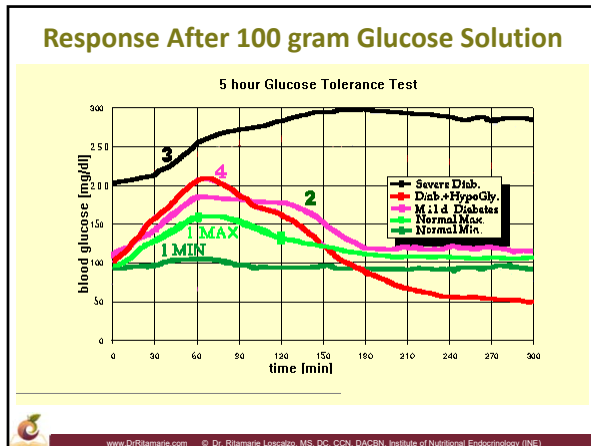
Post-Prandial Blood Sugar

✓ Studies of native populations who exercise and eat whole foods show that their **post-prandial glucose rarely goes above 100**

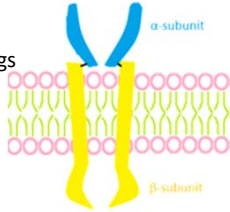✓ I ask my patients to target/keep **below 110**

Hemoglobin A1C

***If fasting glucose is high and hemoglobin A1C is normal, it may be a vitamin B1 deficiency.**

✓ Calculate average glucose from hemoglobin A1C: http://www.drritamarie.com/go/A1Ccalc

✓ A normal non-diabetic level of HbA1C is considered 3.5 – 5.5%

✓ The ideal HbA1C is 4.5 – 5%

Results of Insulin Resistance

➜ Prolonged inhibition of fat burning
  ➜ Excess belly fat
    ➜ Decreased lean muscle mass
      ➜ Damage to blood vessel linings
        ➜ Systemic inflammation
        ➜ High blood pressure
          ➜ "Thick" blood
            ➜ Water retention
              ➜ Initiation of cancer through oxidative damage and IGF-1

α-subunit

β-subunit

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Serious Consequences of IR

Increased body fat

Thyroid and growth hormone deficiency

Increased cancer risk

High blood pressure

Injury to blood vessel linings

Systemic inflammation

Risk of Alzheimer's

Low energy in all organs and glands

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Assessment of Insulin Resistance: 5 Most Important Lab Tests

✓ Fasting glucose
✓ Fasting insulin
✓ Triglycerides
✓ HDL
✓ Hemoglobin A1C

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Lab Marker Patterns

	Optimal	Conventional	Insulin Resistance	Metabolic Syndrome	Diabetes
Fasting Glucose	75 - 85	75 - 99	100 - 119	> = 100	> = 120
Triglycerides	50 - 75	≤ 150	> 90	> 110	> 150
HDL	> 65	> 50	< 65	< 55	< 55
Fasting Insulin	2 - 3	2 - 10	> 3.2	> 5	> 5
Hemoglobin A1C	4.5 - 5%	4.5 - 5.6%	5.7 - 6.5%	> 5.7%	> 5.7%

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5 Key Steps to Restore Balance

| Increase	• insulin sensitivity
Decrease	• insulin need
Reduce	• inflammation
Optimize	• fat burning and lean mass building
Minimize	• impact of "candy bar eating" effects of stress

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Key Lifestyle Areas to Address

Timing — Nutrition — Stress — Exercise — Sleep

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Hormone Imbalances to Study Related to Insulin Resistance

✓ Insulin
✓ Leptin
✓ Thyroid
✓ Cortisol
✓ Growth Hormone
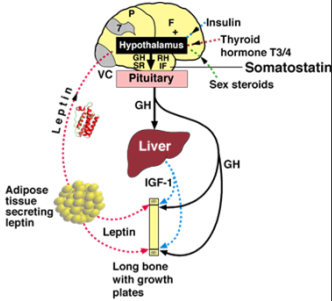
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Reversing Insulin Resistance

- Avoid trans fats
- Increase DHA (docosahexaenoic acid) omega-3
- Decrease omega 6:3 ratio
- Improve minerals: chromium, magnesium, zinc
- Improve B-vitamin status
- Resistance exercise and manual labor
- Burst training
- Avoid sugar, processed foods, starches, fruit juices, soda
- Reduce stress via hypercortisolemia
- Sufficient protein and protein absorption

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How to Eat for Insulin Balance

- Never eat after dinner
- Eat only three meals a day
- Allow four to six hours between meals
- Eat to full and do not overeat or undereat
- Eat slowly and calmly
- Practice breathing and appreciation before each meal
- Eat a breakfast containing protein

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Gluten Antibodies and Blood Sugar

- ✓ Type 1 diabetes results **from autoimmune attack** on pancreas
- ✓ Recent experiments suggest that **stopping the autoimmune attack** on the islet cells in the pancreas may reduce or reverse some cases of type 1 diabetes
- ✓ **Type 1 diabetes is associated with blood antibodies to wheat protein as well as dairy (casein especially)**
- ✓ Autoimmune conditions are *strongly associated* with **gliadin sensitivity**
- ✓ Studies of infants of type 1 diabetic parents demonstrate that **feeding gluten to those infants** greatly increases the development of autoimmune attack on the infant pancreas (by factors of **5 to 7 times greater risk**)

http://www.drrritamarie.com/go/DiabetesGlutenFree

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5 Most Important Nutrients

- ✓ **Chromium Polynicotinate:** 400 mcg twice a day
- ✓ **Magnesium Citrate, Glycinate, or Natural Calm:** Review *"Magnesium Loading"* document
- ✓ **DHA:** 350 to 500 mg per day, preferably algae oil based; review omega 3-6 documents
- ✓ **Zinc:** 30 – 60 mg per day, liquid preferred
- ✓ **B Vitamins:** Activated forms, liquid preferred

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Other Important Nutrients

- ✓ **Vitamin C:** 1000 mg 3x/day or to bowel tolerance (see *"Vitamin C Calibration"* instructions)
- ✓ **Vitamin D3:** 1,000 IU - 20,000 IU per day -- test
- ✓ **B Vitamins:** For overall energy and hormone support
  - ➤ **Vitamin B6:** 50 mg 2x/day
  - ➤ **Pantothenic acid:** 300 mg 3x/day
  - ➤ **Niacin:** 30 - 100 mg /day; **Niacinamide:** 500 mg 3x/day
- ✓ **Potassium**: Up to 99 mg /day
- ✓ **Lipoic acid**: 600 mg 2x/day

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Replenish Nutrients with Food

✓ **Green Leafy Vegetables:** magnesium, B-vitamins, antioxidants, minerals

✓ **Sea Vegetables:** minerals and omega-3 fats

✓ **Chia Seeds, Flax Seeds, Hemp Seeds:** omega-3 fats

✓ **Pumpkin Seeds:** zinc

✓ **Brazil Nuts:** selenium

✓ **Protein Powder:** protein deficiency can be due to dietary inadequacy OR impaired digestion

✓ **Small Quantity of Lean Organic, Free-range Animal Protein or Fish:** if you prefer to the extra protein powder or in addition

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