Insulin Resistance and Yoga

Ashley Freidel
Carliana Carpenter
Courtney Rokowski
Kristin Costanzo

For our presentation we looked into the effects of the practice of yoga on individuals with Insulin Resistance and Type 2 Diabetes, focusing in on as to whether or not the practice would benefit them with both short and long term effects.

Type 2 Diabetes

High Blood Pressure
Smoking
High Fat and Cholesterol Levels
Sedentary Lifestyle
Overweight

How can we manage insulin resistance before it develops into type 2 Diabetes?

What is insulin resistance?

Type 2 Diabetes

- Type 2 Diabetes makes up 90% percent of individuals who have Diabetes typically due to obesity and physical inactivity.
- Type 2 Diabetes is a result from the pancreas being unable to use insulin effectively (World Health Organisation).

Yoga

- Yoga has been practiced in India for over 4000 years and there are many ancient books that depict the healing properties behind the practice (5).
- Lately yoga has been put under scientific evaluation as to whether or not the practice will actually rid the body of communicable diseases such as Diabetes.

Overview of Yoga's Benefits

- Reduces Insulin Resistance
- Decreases fasting blood glucose levels
- Lower blood pressure
- Improve cholesterol and triglycerides
- Reduce the need for diabetes medication
- Lower stress hormone levels
- Increases flexibility and strength
- Improves balance and immune function
- Precipitates weight loss
- Relieves stress
- Alleviates chronic pain (7)

Research has suggested that yoga's contribution to stress reduction actually may moderate the impact of diabetes. High levels of stress hormones have been shown to raise blood glucose levels, promote overeating, lead to the accumulation of intra-abdominal fat, contribute to insulin resistance, and boost heart attack risk. By reducing stress hormone levels, yoga can minimize these side effects.

Help in Prevention of Type 2 Diabetes

- In 2007 a study was done to assess the role of yogic practices on glycemic control, insulin kinetics, body composition, exercise tolerance, and various co-morbidities like hypertension and dyslipidemia.
- 20 type 2 diabetics and 4 type 1 diabetics were studied for one month. They practiced 4 types of Pranayama for 30 minutes followed by Shavasana for 15 minutes. Patients developed a sense of well being within 7 to 10 days and showed a significant fall in fasting and post-prandial blood glucose values.
- In 4 of 17 patients the requirement of drugs came down significantly. There was normalization of the insulin glucose ratio in 5 of these 20 type 2 diabetic patients. (6)

- Yogic practices in all these studies have produced an increase in the lean body mass and decrease in body fat percentage. This leads to an improvement in insulin sensitivity and reduction in Insulin Resistance. Insulin Resistance is the major abnormality in type 2 diabetes and precedes the development of overt diabetes by several years.
- Reduction in free fatty acid levels reduces lipotoxicity, which has a significant effect on beta cell function. Therefore it is reasonable to postulate that the beneficial effects of yoga on insulin kinetics and lipid metabolism prevents beta cell exhaustion and development of a beta-cell secretory defect, preventing development of type 2 diabetes. (6)

- In the last few years, new clinical studies and reviews have been published on yoga and diabetes, providing more evidence of its benefits. The most recent study found that three months of yoga along with standard care significantly reduced BMI and improved glycemic control compared with standard care alone.
- Another study reported that after 40 days of yoga, adults with type 2 diabetes experienced significant reductions in their BMI and anxiety as well as improved general well-being. Three of these adults, at high risk for type 2 diabetes, experienced improvements in weight, blood pressure, insulin control, and triglycerides upon completion of the yoga regiment, compared to a group of patients receiving only diabetes education materials. (7)

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Increase Adiponectin Release

- Yoga's efforts increase the release of an adipocyte-derived hormone called adiponectin.
- Adiponectin decreases Insulin Resistance by decreasing triglyceride content in muscle and the liver. This effect results from increased expression of molecules involved in both fatty-acid combustion and energy dissipation in muscle. (5)

Beneficial Yoga Poses

Yoga poses that may be particularly beneficial for type 2 diabetes patients:

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Quiz Time

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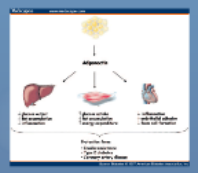

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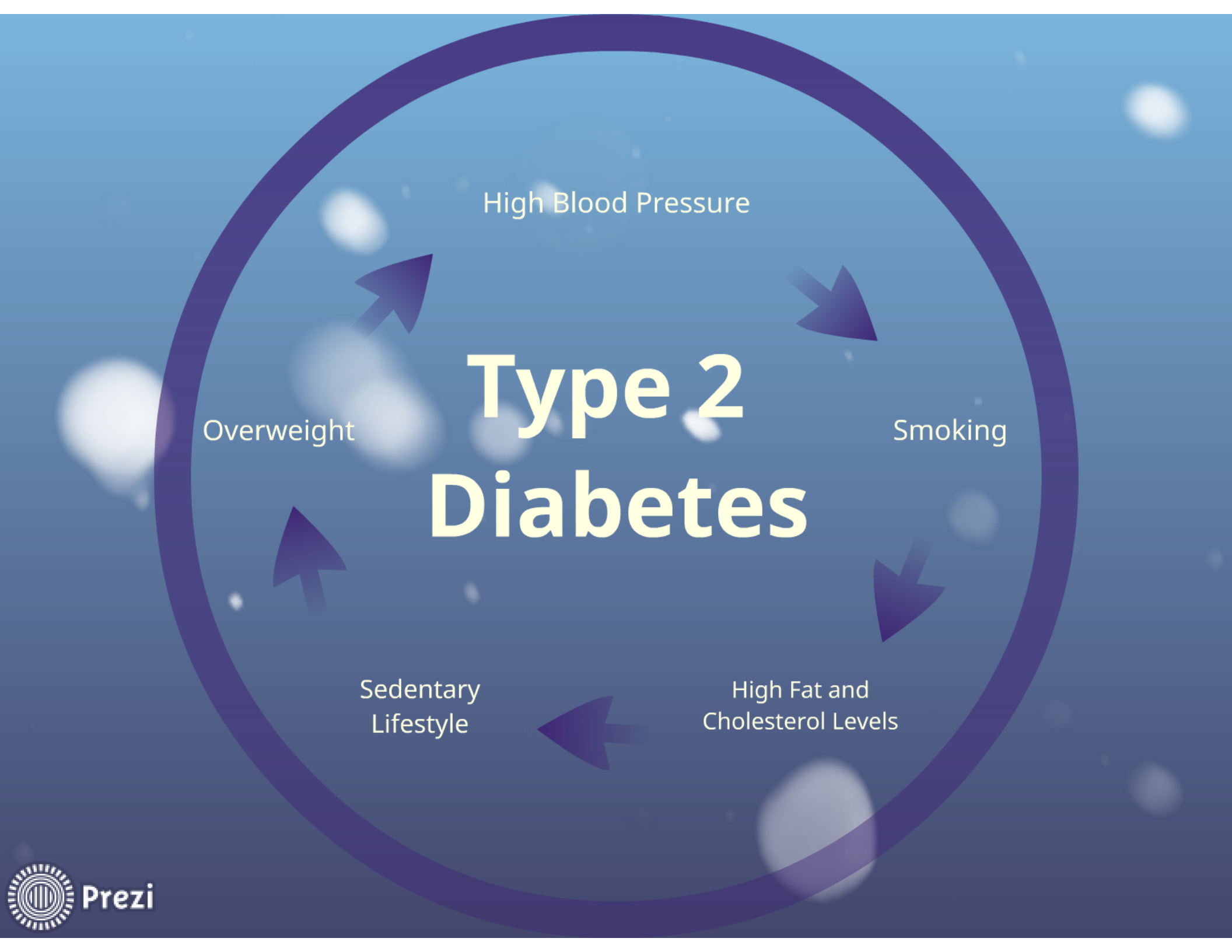
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- **Yoga enhances cardiac vagal activity (the action of the vagus nerve; the 10th cranial nerve, which relays information between the brainstem and most of the internal organs) and reduces sympathetic activity (stimulates the fight or flight response) and increases parasympathetic activity (rest and digest response).**
- **In conclusion those who practice yoga over a long period of time have better glucose disposal and Insulin Sensitivity irrespective of their body weight and composition. (4)**

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- Serum adiponectin concentrations were significantly correlated with waist circumference, HDL cholesterol, diastolic blood pressure, and homoeostasis model assessment-insulin resistance in the post-yoga exercise group.
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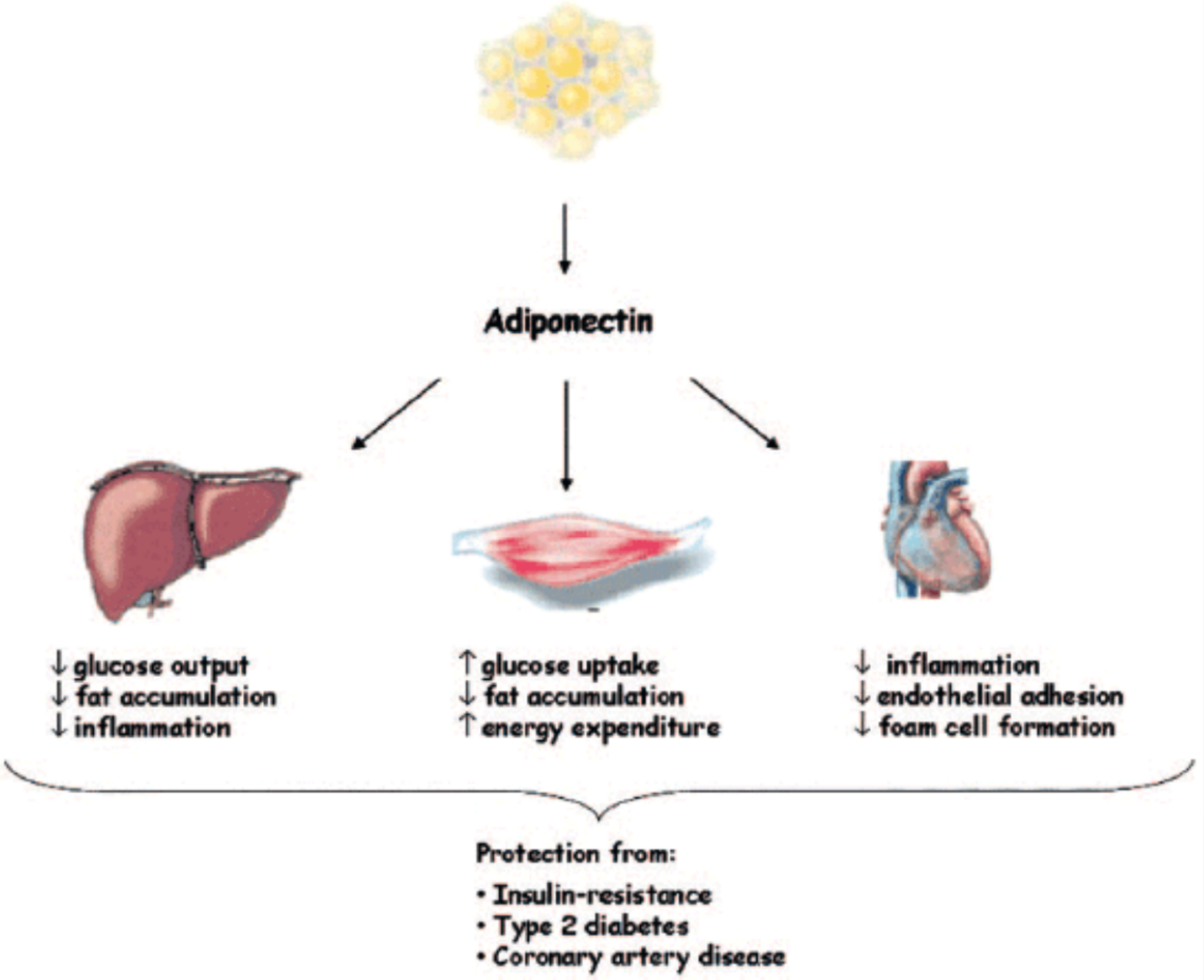

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C. Diabetes Insipidus
D. Insulin Shock

B. Insulin Resistance

2. What percentage of Diabetics have Type 2 Diabetes?:

A. 90%

B. 52%

C. 77%

D. 25%

A. 90%

3. What decreases Insulin Resistance by decreasing triglycerides content in muscle and the liver?

A. Calcitonin

B. Dopamine

C. Adiponectin

D. Melatonin

C. Adiponectin

4. Which yoga pose is the most beneficial for regulating Insulin?

A. Seated Spinal Twist

B. Child's Pose

C. Locust Pose

D. Sun Salutation

A. Seated Spinal Twist

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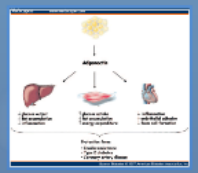

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