Diabetes

What is it, and how does it affect your clients?

Brad Dieter, PhD, MS



THE AGENDA

Discussion points for today

01	What is it?
02	Why does it matter?
03	What do we do about it?



Diabetes: What Is It?

A group of diseases that result in blood sugar that is above normal level.

BLOOD GLUCOSE LEVELS



Normal Level

Hypoglycemia (low blood sugar) Hyperglycemia (high blood sugar)





High Blood Diabetes Sugar







Diabetes, by definition describes a symptom, not

a cause.



The natural history of disease indicates that the disease state of hyperglycemia is not the underlying cause, but a resultant feature of disordered metabolism.



Diagnosis How it is diagnosed and why that matters



Diagnostic Testing



Glycated Hemoglobin: provides an estimate of average blood sugar over a ~3 month time frame

Fasting Glucose: provides a proxy of insulin resistance based on how high above baseline your "basal" glucose

Oral Glucose Tolerance Test (OGTT): provides a measure of how your body responds to a bolus of glucose.



HbA1c & Blood Glucose

HbA1c Levels (%)



HbA1c Levels (%)





HbA1c & Diabetes



Oral Glucose Tolerance Test

Oral Glucose Tolerance Test



Blood Glucose (mg/dL)







While the disease process begins much earlier than elevated blood glucose appears, clinically it is diagnosed based on measures of glycemia.

This means that by the time a client receives a diagnosis, the disease process is in full swing.



Diabetes

Why Does it Matter to Us As Health and Fitness Professionals









3+

<u>Twig et al. 2014</u>

Normal Weight

Diabetes is not simply a disorder of elevated blood sugar, but of disordered metabolism, affecting virtually every organ system. This will change how your clients respond to exercise and their dietary needs.



Diabetes & Fat Metabolism

One of the most interesting aspects of type 2 diabetes is that fat metabolism is impaired, while glucose metabolism is relied upon more heavily







MACROS INC FITNESS + NUTRITION MADE SIMPLE

Bonen et al. 2004





Bonen et al. 2006



Perez-Martin et al. 2001



Individuals with diabetes show different metabolic responses to exercise.

Understanding how their body responds differently is critical for appropriate exercise programming.

Except...



In non-obese individuals with diabetes (~12%), changes in metabolism due to exercise are much more subtle



Borghouts et al. 2002

Considerations

Identify the client's current state and adjust based on their circumstance

→ Intensity

What level of exercise intensity can they handle?

→ Duration

Is their "endurance" compromised?

→ Recovery

How will impaired fat metabolism slow recovery?

#IEFC2021

Do lifestyle changes such as evercise

Do lifestyle changes such as exercise and diet actually have any effect on disease?







"Lifestyle interventions are one of the most effective interventions for reducing the risk of diabetes and for addressing (treating) it."





	Resistance Training	нііт	MICD	Conclusion
Body Weight	Lowest Effect	Biggest Effect	Biggest Effect	HIIT or MICD Most Effective for Weight Loss
Glucose Control	Moderate Effect	Moderate Effect	Moderate Effect	Similar Results Across Exercise Type
Lean Body Mass	Largest Effect	Minimal Effect	Minimal Effect	Resistance Training is Most Effective for Lean Body Mass
Cardiovascular Risk	Moderate Effect	Moderate Effect	Moderate Effect	Similar Effects, Slight Edge to Both Aerobic Forms
VO2 Max	Minimal Effect	Moderate-to-High Effect	Moderate-to-High Effect	HIIT or MICD Most Effective for Improve Aerobic Capacity

	Aerobic Training	Resistance Training	Combined Exercise
Body Weight	Reduction in Body Weight	Minimal Reduction in Body Weight	Reduction in Body Weight
Glucose Control	Improves Glucose Control	Improves Glucose Control	Largest Improvement in Glucose Control
Fat Mass Reductions	Reductions in Visceral Fat	Reductions in Visceral Fat	Reductions in Visceral Fat
Strength Increases	Minimal Strength Increases	Modest to Robust Strength Increases	Modest to Robust Strength Increases



No single form of exercise is "best" for clients with type 2 diabetes.

Ideally, aerobic training and resistance training are included in a training plan for clients with diabetes.

Current ADA guidelines reflect this with recommendations of both types of exercise.



Diabetes Nutrition Considerations



Diabetes is precipitated by excess energy, which is the result of either too much energy coming in or too little energy going out.

Changes in overall metabolism are the result of that energy imbalance.

As such, one could theorize that improving the energy balance (i.e. weight loss) is likely the best approach to addressing the root cause.







Weight loss is the primary driver for reducing the risk of diabetes and increasing the likelihood of "remission"...

BUT are some nutritional approaches more effective than others?





Diet Archetypes: What type of diet, if any is the most effective in this population?

Level of Intervention: How deep of a dive do people need?

Behavior Change: What aspects of behavior change are the most effective?



	Weight Loss	HbA1c	Fasting Glucose	Lipids
Low-Carb	Moderately Effective	Effective	Effective	Moderately Effective
Low-Fat	Moderately Effective	Moderately Effective	Moderately Effective	Effective
Plant Based	Moderately Effective	Effective	Effective	Effective
Mediterannean	Moderately Effective	Effective	Effective	Effective
Paleo	Moderately Effective	Moderately Effective	Effective	Moderately Effective
Low GI/GL	Moderately Effective	Moderately Effective	Effective	Moderately Effective
High Protein	Moderately Effective	Moderately Effective	Moderately Effective	Moderately Effective





Level of Intervention







Diabetes: What Is It?

- A disease of elevated blood sugar.
- The cause of the disease is linked to energy overload and metabolic dysfunction, glucose is not the cause of the disease.



Diabetes: Why Does it Matter?

- Increases risk of many chronic diseases
- Affects the metabolism of our clients
- Has ramifications on the exercise and nutrition interventions we give our clients



Diabetes: What Do We Do About It?

- Lifestyle management is one of the most powerful interventions for preventing and addressing diabetes.
- Aerobic and resistance training are essential for the ideal intervention.
- Nutrition interventions are critical for weight loss for almost all people. MACROS

5S + NUTRITION MADE SIMPLE

Diabetes: What Do We Do About It?

- Any diet can work. Find the approach that best suits the individual client.
- Coaching is highly effective. Offers excellent ROI compared to more intensive interventions.
- Behavior change is best achieved through modulating environment, feedback, and reward systems.

5S + NUTRITION MADE SIMPLE

THANK YOU!

Download Slides: macrosinc.net/diabetes-iefc-2021/ Email: brad.dieter@macrosinc.net Website: Macrosinc.net Instagram: Macroslnc

