

# The Effects of Exercise on Diabetes Mellitus II

Jarrett Thompson & Tyler Marinelli

Gardner-Webb University



## INTRODUCTION

## EXERCISE GUIDLINES

## DIETARY RECOMMENDATIONS

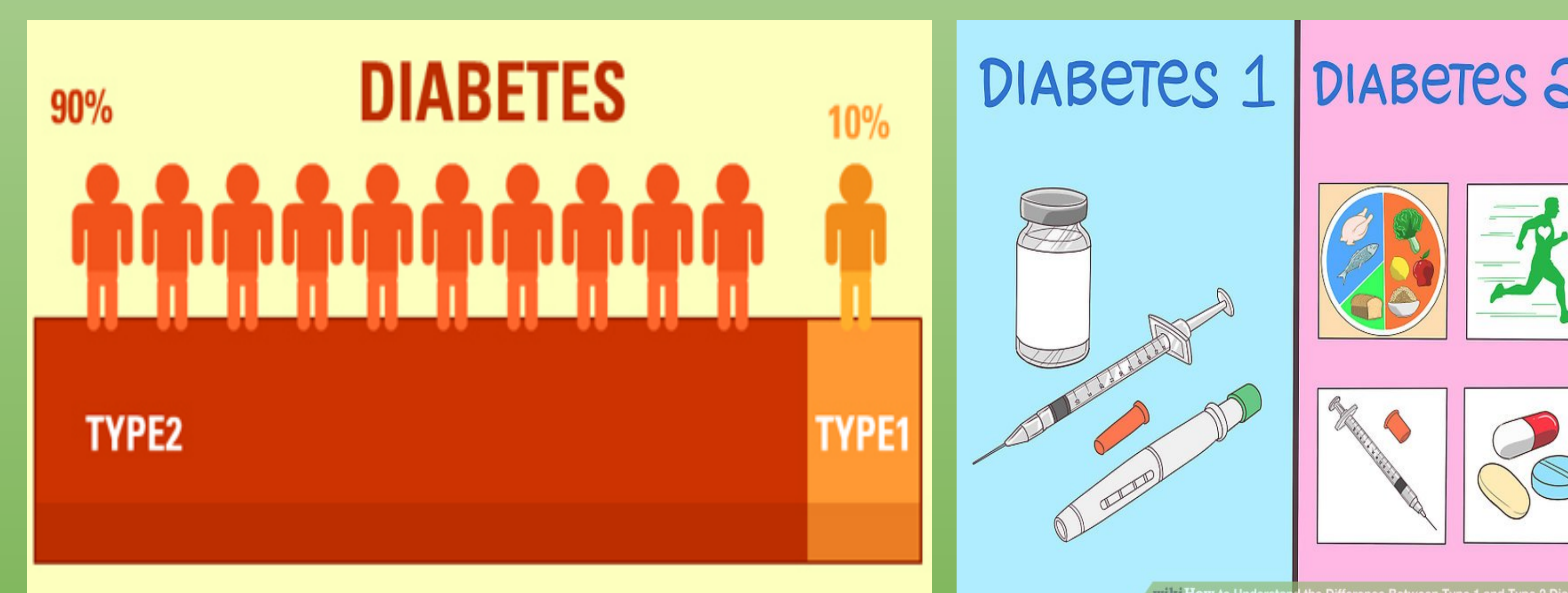
- According to American Diabetes Association (2015), Diabetes mellitus (DM) is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.
- In 2015, 30.3 million Americans, or 9.4% of the population, had diabetes. Approximately 1.25 million American children and adults have type 1 diabetes (American Diabetes Association, 2015).
- 90% of the population whom is diagnosed with DM is diagnosed with Type 2 (Goodpaster et al., 2000).
- When being diagnosed with DM, one must have a fasting plasma glucose (FPG) of  $\geq 7.0$  mmol/L, glycated hemoglobin (A1C) of  $\geq 6.5\%$  (in adults), 2-hour plasma glucose (2hPG) of  $\geq 11.1$  mmol/L, or a random plasma glucose (RPG) of  $\geq 11.1$  mmol/L (Punthakee et al., 2017).
- You are more likely to develop type 2 diabetes if you are age 45 or older, have a family history of diabetes, or are overweight. Physical inactivity, race, and certain health problems such as high blood pressure also affect your chance of developing type 2 diabetes. You are also more likely to develop type 2 diabetes if you have prediabetes or had gestational diabetes when you were pregnant (American Diabetes Association, 2015).
- Type 2 diabetes symptoms are subtle, so it may take years to detect type 2 diabetes mellitus. Because the body is not processing food correctly, there are a variety of symptoms that manifest. These include:
  - Increased thirst: High sugars pull fluid from your tissues, making your very thirsty.
  - Increased hunger: Your body isn't absorbing energy properly, so you are more hungry.
  - Fatigue: Because your cells aren't getting the energy they need you may become tired.
  - Blurred vision: High blood sugar can cause fluid to build up in the lenses of the eyes.
  - Being slow to heal from sores or infections: Diabetes affects your body's responses to ailments.
  - Areas of darkened skin: Especially in the armpits and neck, this is a sign of insulin resistance. (American Diabetes Association, 2015).
- Type 2 DM is typically associated with excess body fat with fat distribution usually in the upper body (ElKafrawi, Shoaib & Elghanam, 2017).

	Aerobic	Resistance	Flexibility
Frequency	5 to 7 days per week with the goal of 30 minutes of continuous aerobic activity per session.	2-3 days per week with 48 hours between workouts	Flexibility workouts should be performed every other day.
Intensity	50-85% of heart rate reserve, or a rating of 12-16 on the perceived exertion scale.	Beginners should start with 50-70% of 1RM and gradually progress over the course of 3-6 months.	Stretch until the feeling of slight discomfort.
Duration	30 min per session (150 min per week), or 60 min per session (300 min per week) for weight management.	30-60 minutes of exercise per session. Performing 10-12 multipoint exercises with 2-3 sets and 8-12 reps.	A single stretch should be held for 10-30 seconds. The total duration of the workout should be 20-25 minutes.
Mode	Exercises with continuous rhythmic movements that work large muscle groups such as biking or swimming.	Many modes of exercise are available, but the goal is to use free weights.	1-2 static stretches per major muscle group is recommended.

- According to American Diabetes Associations (2015), individuals with diabetes should monitor the amount of carbohydrates they consume in their daily diet.
- Foods to Eat
  - Meat, Poultry and seafood
  - Eggs
  - Cheese
  - Non-Starchy vegetables
  - Avocados
  - Olive oil, Coconut oil
- Foods to Avoid
  - Breads, pasta, cereal, corn, other grains
  - Potatoes, peas, beans
  - Milk, juices, soda, beer
  - Deserts

## SPECIAL CONSIDERATIONS

- All individuals who have been diagnosed with type 2 diabetes must be cleared prior to beginning a vigorous exercise program. (Jacobs, L. P., 2018)
- Individuals with Type 2 diabetes who have a greater than 10% risk of cardiac over the next ten years should go through a maximal clinical supervised test prior to engaging in any exercise program. (Jacobs, L. P., 2018)
- Type 2 diabetes may result in a patient having silent ischemia, a symptom where insufficient blood flow reaches with heart but does not show any clinical signs or symptoms. A radionuclide injection may allow for detection of ischemia. (Jacobs, L. P., 2018)
- Type 2 patients tend to suffer from Hyperglycemia. A abnormal response to exercise that results from a blood glucose levels of  $<70$  mg/dl. (Jacobs, L. P., 2018)



## BENIFITS OF EXERCISE

## REFERENCES

- According to (), Aerobic exercise it thought to improve glycemic control in type 2 diabetes patients by a means of increasing insulin sensitivity. Furthermore, it is believed that resistance training also helps improve glycemic control by increasing the amount of skeletal muscle in the body.
- HIIT exercise has proven to effective in increasing vascular structure and function in individuals with type 2 diabetes (Francois, M. E., Pistawka, K. J., Halperin, F. A., & Little, J. P., 2018).
- Exercise can be very beneficial when it comes to improving and individuals quality of life and mental health. Physical activity can be used as an intervention to help prevent depression and reduce anxiety in individuals with type 2 diabeteses ().
- According to (Colberg et al., 2016), Balance and Flexibility exercises have been effective in reducing the risk of falling, especially in the older population. Yoga is a mode of balance and flexibility exercise that is thought to improve glycemic control, lipid levels, and body composition in adults with type 2 diabetes.

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## Recent US co-morbidity

