

Exercise to Prevent and Treat Diabetes

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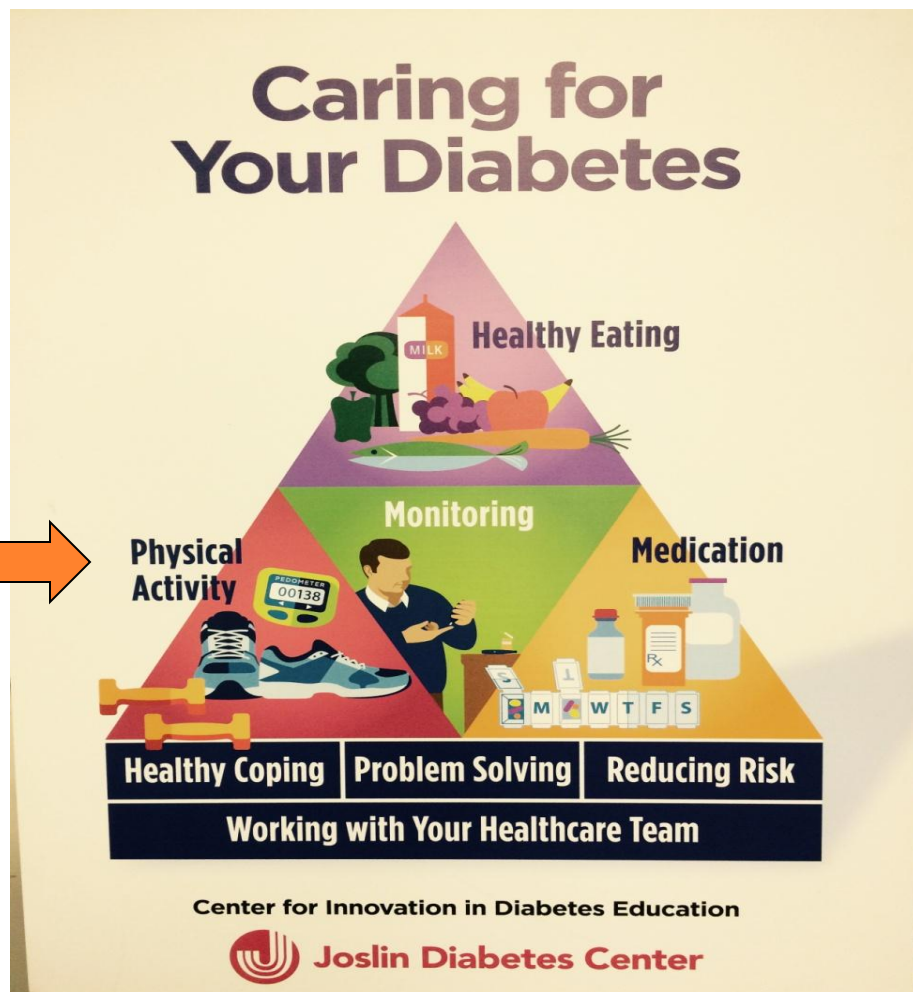
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Objectives

- Review the benefits of exercise related to diabetes
- Learn the recommendations to prevent and treat diabetes
 - Aerobic exercises
 - Resistance exercises
 - Balance exercises

Exercise and Physical Activity

- A cornerstone of diabetes management, along with meal planning, medications and monitoring



Exercise and Physical Activity

- What is physical activity?
- What is exercise?
- Which is better?



Benefits of Exercise and Physical Activity

- Lowers blood glucose
 - Use glucose for energy
 - Decrease insulin resistance
- Improves cardiovascular parameters: blood pressure, lipids
- Reduces body fat
- Assists with weight loss/maintenance
- Improves fitness
- Reduces stress/improves sense of well being
- Maintains bone health
- Improves balance
- Prevents/delays onset of type 2

Recommendations to Prevent Diabetes

- Diabetes Prevention Program (DPP)
 - Pre-diabetes: Lifestyle intervention, metformin, control
 - Goal: ≥ 150 mins/wk moderate exercise combined with modest caloric restriction for 7% wt loss
- Lifestyle intervention \downarrow the onset of type 2 diabetes by 58%

Recommendations to Prevent Diabetes

- Pre-diabetes
 - Diet-induced weight loss of 5-7% body weight
 - Increasing physical activity to 150 mins/week of moderate activity (i.e., walking) to vigorous activity
 - Follow-up counseling
 - Metformin



Recommendations to Treat Diabetes

- Aerobic/cardiovascular exercise
 - Sustained exercise that stimulates and strengthens the heart and lungs, thereby improving the body's utilization of oxygen
 - Examples: walking, jogging, rowing, swimming, cycling, or dancing

Recommendations to Treat Diabetes

- Aerobic/cardiovascular exercise
 - For blood glucose control, weight maintenance, decrease risk of cardiovascular disease (CVD)
 - ≥ 150 min/wk moderate-intensity
and/or
 - ≥ 90 min/wk vigorous
 - in ≥ 10 min bouts
 - At least 3 days/wk; no more than 2 consecutive days w/o aerobic
 - Large muscle groups and causes sustained \uparrow HR

Recommendations to Treat Diabetes

- Resistance training

- A type of physical activity where you exercise a muscle or muscle group against outside resistance
- Using body weight, free weights (dumbbells and barbells), weight machines, medicine balls, or exercise bands.



Recommendations to Treat Diabetes

- Resistance training
 - Improves glucose control (\downarrow A1c, \uparrow muscle glycogen stores)
 - \uparrow muscle mass and strength (slows changes of aging)
 - \downarrow trunk fat mass
 - \downarrow dose of diabetes meds
 - \downarrow systolic blood pressure
 - Improves balance to prevent falls (lower extremity exercises)
 - Improves bone density
 - Improves ability to do normal activities

Recommendations to Treat Diabetes

- Resistance training
 - In the absence of contraindications:
 - At least 2 times/wk, non-consecutive days (ideally 3 times/wk)
 - Intensity of moderate or vigorous
 - All major muscle groups (5-10 exercises)
 - Start at 1 set of 10-15 reps to fatigue and progress to 3-4 sets of 8-10 reps of 8-10 repetition maximum (RM)

Recommendations to Treat Diabetes

- Weight Loss/Maintenance
 - 1 hr/day moderate aerobic exercise can ↓weight but small amounts (<11 pounds)
 - Most successful with caloric restriction and behavior management for weight loss; higher intensity
 - Sustain weight loss, 7 hr/wk moderate to vigorous intensity
 - Improved CVD risk factors even w/o weight loss
 - Consider resistance training to build muscle mass and improve metabolism

Recommendations for Balance Exercise

- Balance
 - Challenges increase as we age, with vision changes, if sensation in the feet is not normal, with certain medications, etc.
 - Specific balance exercises, along with certain strength exercises, can help prevent falls by improving your ability to control and maintain your body's position, whether you are moving or still

Recommendations for Balance Exercise

- Balance exercises
 - Balance exercises can be done as an exercise session/in a class or throughout your day

Recommendations to Treat Diabetes

- Decrease Sitting
 - Evidence that all individuals, including those with diabetes, should be encouraged to limit time being sedentary by breaking up extended amounts of time (>90 min) spent sitting

What are your goals?

Lower blood glucose

Prevent/delay diabetes

Lose
Lose
weight
weight

Improve heart health

**Feel stronger
and
move better**

Lower blood pressure

Feel better

**Do things
with others**

Improve cholesterol

What can you do?

-
-
-
-
- Exercise
- Physical activities
 - House chores
 - Yard activities
 - Recreation
 - Work activities
- Add steps to your day
 - Pedometer or activity tracker

How much should you do?

- Total minutes per week 150
- Minutes at a time 5-60
- Times per day 0-6
- Days per week 3-7

How hard?

- Easy/leisurely pace

Many, many minutes per week

- Moderate pace

About 150 minutes per week

- Vigorous pace

About 90 mins/wk

Getting Started

-
-
-
-
- Choose a goal: What do you want to gain/lose?
- Make a plan
- Pick your time
- Add a friend/family member; share your plan
- Think of a reward for meeting a goal
- Make it fun
- Start slowly/safely
- Get help if you have barriers such as pain

Overcoming Barriers

- Choose the right activity
- Get support from others
- Exercise early in the day if possible
- Have a “bad weather” plan
- Don't feel guilty about helping yourself

Sticking to it

- Use a log/calendar
- Avoid “all or nothing” attitude
- Make it fun; mix it up
- Increase minutes from your starting point
- Add a friend/family member
- Monitor how you feel
- Get your reward and set a new goal



Specific Exercises

- Aerobic exercises
 - Walking
 - Bicycling (outdoor or stationary)
 - Elliptical/glider/arc trainer
 - Swimming/water exercise
 - Dancing/dance aerobics
 - Exercise video
 - Exercise class

Specific Exercises

- Resistance exercises
 - Incline push-ups
 - Biceps/triceps isometrics
 - Abdominal isometrics
 - Chair rises
 - Heel raises

Specific Exercises

- Balance exercises

- Static

- Hold for 30 seconds
- Normal stance
- Narrow stance
- Semi-tandem
- Tandem
- Single limb

- Dynamic

- Walk on a tightrope
- Sidestepping
- Cross-overs
- Carioca
- Head turns
 - Right/left
 - Up/down

You should feel safe but wobbly as you perform the exercise.



Questions?