Topics for Discussion

* Motivating patients with diabetes to exercise
* Prescribing exercise regimens for PWD
* Considerations for special populations
Motivating Patients with Diabetes to Exercise
“I see you’ve doubled your amount of daily exercise. Unfortunately, two times nothing is still nothing.”
More SPA Time for Everyone

- More spontaneous physical activity (SPA), or daily movement
- Break up sedentary time
- Adding in little bits of exercise during the day easier for many
- Fitness gains less, but still bestows health benefits
Easy Ways to Be More Active

- Walk or bike instead of drive
- Take the stairs (up or down)
- Park farther away
- Do house or yard work
- Walk the dog
- Play with kids/grandkids
- Stand up while on phone
- Get up more often
Break Up Prolonged Sitting

Dunstan DW et al. Diab Care, 35(5): 976-83, 2012
T2D Break Up Prolonged Sitting

3-min ex. breaks every 30 min

Dempsey PC et al. Diab Care, 39(6): 964-72, 2016
Overcome Exercise Barriers

“I don’t have time to exercise 30 min a day”
- Break up exercise time throughout the day
- Start with 10 minutes a day
- Work up to 10 min at a time, 3 times a day

“I’m too tired after work to exercise”
- Be active before work or during the day instead
“I can’t afford a fitness center or equipment”

- Pick an activity that doesn’t require equipment, such as walking
- Use cans of food or water bottles for weights
- Buy some inexpensive resistance bands
Overcome Exercise Barriers

“I don’t have access to childcare”
- Walk or bike with the kids
- Find a rec center that offers childcare
- Get a group to take turns watching the kids

“It’s too hot/cold outside”
- Walk inside (at a mall, at work, at school, etc.)
Overcome Exercise Barriers

“I don’t feel safe in my neighborhood”
- Form a walking group
- Do classes on video or at a gym
- Be active near work or school
Prescribing Exercise Regimens to PWD
General Aerobic Exercise Rx

* **Mode:** walk, swim/aquatic, cycle, run, chair exercise, dance (depends on preferences, skill level, limitations, etc.)

* **Intensity:** moderate (ability to carry on a conversation without struggling to breathe) to vigorous

* **Frequency:** spread over at least 3 days, with no more than 2 consecutive days without aerobic activity

* **Duration:** 150 minutes of moderate or 60–75 minutes of vigorous activity a week

* **Progression:** initially 10–15 minutes; increase over time to 30+ min; increase intensity last (or include faster intervals)
Aerobic Activities

- Aim for 150 min/wk moderate to vigorous
- Min. of every other day
- Walking at any speed (w/ good socks/shoes)
- “Cardio” machines, stationary cycling, aquatic/pool or chair exercises, upper body

Alternate Aerobic Activities
General Resistance Exercise Rx

* **Mode:** free weights, weight or resistance machines, resistance bands, isometric ex, calisthenics; at least 8–10 ex. for major muscle groups (upper and lower body, core)
* **Intensity:** moderate to vigorous (i.e., 60–80% of 1-rep max)
* **Frequency:** at least 2x weekly on nonconsecutive days, but more ideally 3 days per week
* **Duration:** minimum of 1 set of repetitions to near fatigue, but as many as 3–4 sets per exercise, 8–15 reps per set
* **Progression:** increase wt. when target # of reps per set met/exceeded, then # of sets, and lastly training frequency
Resistance Activities

* At least 2 days per week, preferably 3 (nonconsecutive)
* Any intensity (15 reps moderate, 10 reps high)
* 2-3 sets per ex
* Work large muscle groups & “core”
* Bands, machines, free wts, body wt as resistance

Colberg et al., Diabetes Care, Dec. 2010
Try to Get Your Patients to:

- Be regularly physically active and move more to keep insulin action enhanced
- Make physical activity fun to increase compliance (i.e., try new activities)
- Pick activities that avoid injury
- Include both aerobic and resistance workouts to maximize muscle gains
- Exercise more vigorously (at least on occasion) to ↑ muscle glycogen use (some intervals okay)
Core Training Exercises

Chair Sit-Ups

“Superman” Exercise

Colberg S. *The 7 Step Diabetes Fitness Plan*, 2006
Include Flexibility Training

- Stretches best done at least 2–3 days per week or after any exercise session
- Include all major muscle groups
- Hold static stretches for 10–30 seconds or do dynamic stretching
- Especially critical with diabetes
Do Balance Training, Too

- Any balance exercises may help prevent falls
- All lower-body strength exercises improve balance
- Stand on one leg, holding on with 1–2 hands
- Try with eyes open and closed
Low-Intensity Balance Training

Key Exercise Behaviors

- Check blood glucose often to learn to predict responses and establish patterns
- Be regularly physically active to enhance insulin action and metabolic health
- Include both aerobic and resistance exercise to maximize insulin action (and muscle mass)
- Include balance and flexibility training, too, especially for older adults
- Break up sedentary time with frequent movement
Older Adults

- Older adults often with comorbid health conditions, including overweight/obesity, hypertension, etc.
- Joint or other physical limitations

- Encourage them to be as active as possible, given their constraints
- Include resistance, balance, and flexibility training
- Activities to help reduce risk of falling
Overweight/Obese Adults

- Overweight/obese often with health issues
- Joint or other physical limitations

- Pick activities that are easier to do with excess weight (aquatic, stationary cycling, seated)
- If self-conscious in groups, pick home-based or other activities that can be done alone
- Start out slowly and progress slowly
Osteoarthritis

- Overweight/obese often have arthritic joints
- Regular activity possible and encouraged
- Moderate activity may actually alleviate joint pain
- Low, moderate, and/or non-weight-bearing best
- Range of motion activities
- Resistance training to strengthen muscles around joints
- Avoid activities with potential for joint trauma
Orthopedic/Joint Limitations

- Do regular stretching and flexibility exercise
- Progress slowly to manage joint changes and limitations
- Avoid activities that aggravate joints, worsen symptoms

- Individuals with diabetes more prone to structural changes to joints that can limit movement
  - Shoulder adhesive capsulitis, carpal tunnel syndrome, trigger finger, metatarsal fractures, and neuropathy-related joint disorders (Charcot foot)
Osteoporosis/Osteopenia

- Decreased bone mineral density, higher fracture risk
- Aerobic weight-bearing activities (walking, standing)
- Avoid excessive twisting, bending, compression of spine during certain activities (e.g., yoga, Pilates)
- No explosive movements or high-impact loading
- Resistance training to prevent falls: lower extremity, core, and high-velocity resistance exercises
Hypertension

* Aerobic and resistance training may lower resting BP
* Hypertensive responses exaggerated during activity

* Avoid Valsalva maneuver during resistance training

* BP meds and exercise-related hypotension (e.g., diuretics)
Vascular Diseases (General)

- Exercise safe with precautions

- Coronary perfusion may be enhanced during higher-intensity aerobic or resistance exercise

- Watch for signs of myocardial infarction, such as chest pain, radiating pain, shortness of breath
Heart Disease/Chest Pain

* Possible to be physically active with diagnosed heart disease or post-myocardial infarction

* All types of activities are encouraged
* Resistance, high-intensity aerobic may enhance cardiac blood flow during the activity
* Recommend supervised exercise training initially
* If chest pain on exertion, keep heart rate at least 10 beats per minute below onset of angina
Peripheral Artery Disease

- People with heart disease frequently have other arterial plaque formation around the body

- Lower-extremity resistance training helps improve overall function, even if painful during

- Choose low- or moderate-intensity walking, arm ergometer, and leg ergometer as aerobic activities

- Doing other activities is usually okay as well

- If leg pain too bad, stop activity and try another one
Diabetic Eye Problems

- Diabetes related to 8 different chronic eye issues, including diabetic proliferative retinopathy

- Don’t exercise vigorously or do any heavy resistance training with advanced or unstable proliferation

- Avoid most jumping, jarring, head-down, or breath-holding activities

- If cataracts or other eye problems are limiting sight, avoid activities like outdoor cycling
Peripheral Nerve Damage

* May be painful or result in loss of sensation in feet
* Physical activity okay, but want to avoid trauma
* Moderate activity may improve symptoms

* Non-weight-bearing activity may be better for many
* Wear socks that keep feet dry, appropriate shoes
* Check your feet every day for sores, blisters or cuts
* Avoid bearing weight on unhealed ulcers
Central Nerve Damage

- Autonomic neuropathy may impact ability to exercise safely, depending on what systems impacted

- Avoid activities with positional changes if get faint when going from sitting to standing

- Use subjective ratings of perceived exertion to monitor intensity if exercise heart rate blunted

- Monitor hydration levels carefully (can overheat)

- See doctor 1st if have cardiac autonomic neuropathy
Diabetic Kidney Disease

- Most can exercise and be physically active without any restrictions with any stage of kidney disease
- Dialysis can cause tiredness and make require exercise modifications to accommodate this
- Adjust your daily activities based on your energy level and overall condition
- Light to moderate activities can be done during dialysis sessions (monitor electrolytes, though)
66 years old, female, type 2 diabetes for over 20 years, marginal blood glucose control (A1C: 7.8%)

Recent loss of feeling in feet (numb on soles, unable to feel ground when walking)

On metformin, a sulfonylurea, sitagliptin, lipid-lowering agent, blood pressure medications, and alpha-lipoic acid

Used to be more physically active, but slacked off lately and rarely does any planned exercise

Job as chef keeps her on her feet a lot, however
Type 2 Diabetes Case Study (PD)

- Which type of aerobic physical activity should PD focus on, giving the loss of sensation in her feet?
- Most common type, distal symmetrical polyneuropathy, involves small and large nerve fibers; greater ulcer risk, possible altered gait and balance
- With neuropathic feet, PD should engage in a variety of exercise, such as stationary cycling, limited walking, conditioning machines, and seated activities
What intensity, frequency, and duration of aerobic physical activity would be appropriate for PD to undertake?

- **Moderate intensity, 3–5 days per week, 150 minutes of aerobic activity per week (more moderate workouts limit potential trauma to feet)**
- **Can add in seated resistance work (2–3 days/week) and balance training**
Type 2 Diabetes Case Study (PD)

- How should PD progress with her physical activity to avoid health complications from arising related to her peripheral neuropathy?
- PD should primarily focus on increasing the duration of her structured workouts to achieve at least 150 minutes of moderate exercise throughout the week.
What will be PD’s main concern(s) and/or precautions once she starts doing more planned physical activity?

- Prevention of injury to her insensate feet
- Use of proper footwear and socks to keep feet dry
- Daily foot inspection for trauma and possible ulceration
- Avoidance of weight-bearing exercise with an unhealed ulcer (but okay when healed)
Activity-Specific Information

Diabetic Athlete’s Handbook
© 2009

Over 100 sports and activities included
Keeping Fit (for Dummies)

Diabetes & Keeping Fit for Dummies

Wiley and American Diabetes Association © 2018
Website with Exercise Info

www.DiabetesMotion.com

JOIN THE ACTIVITY REVOLUTION & GET YOUR DIABETES MOTION™

Whether you're new to exercise or a sports enthusiast, diabetes can get in the way of being physically active. Learn how to catch the next wave.

Catch the Wave >>
Good Advice!

"To prevent a heart attack, take one aspirin every day. Take it out for a jog, then take it to the gym, then take it for a bike ride...."
Questions?