



# IMG PHYSICAL THERAPY

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## Exercise Prescription for a Person with Diabetes Mellitus and Peripheral Neuropathy

### Peripheral Neuropathy: A Probable Complication of DM

- 60-80% of people with DM will develop peripheral neuropathy
- Is a result of damage to the axons and/or the myelin of peripheral nerves
  - Generally as a result of uncontrolled high blood glucose levels
- Signs and symptoms of peripheral neuropathy usually start at the feet and work up the body
- Classic signs and symptoms of peripheral neuropathy:
  - Loss of sensation to vibration, touch, temperature, and proprioception
  - The sensation of tingling, burning, and pain
  - Muscle atrophy and strength loss
- Peripheral neuropathy is a common cause in the development of Diabetic foot ulcers

General Exercise Benefits: American Heart Association recommends 150 minutes per week of moderate-intensity aerobic exercise and muscle strengthening 2 times per week.

- Weight loss
- Increased muscle strength and endurance
- Decreased blood pressure and decreased cardiovascular risks
- Improvements in blood lipid profile
- Enhanced blood flow

### Added Exercise Benefits to People with Type 2 DM

- Improves glycemic control
- Reduces blood glucose levels
- Decreases blood glycosylated hemoglobin (HbA<sub>1c</sub>)

### Weight-Bearing (WB) Versus Nonweight-Bearing (NWB) Exercise in People with DM and Peripheral Neuropathy

- There is no cure for Peripheral Neuropathy. The goal of therapy is to control the condition and prevent further progression
- WB exercises have been shown to:
  - Slow the progression of peripheral neuropathy
  - Help maintaining mobility
  - Promote bone health
  - Preserve and promote the function of peripheral nerves
  - Enhance peripheral nerve conduction velocity
  - Improve sensation
  - Help alleviate neuropathic pain
  - Increase ankle proprioception/balance
  - Increases walking speed

## Sample WB Exercise Prescription for a person with DM and Peripheral Neuropathy

- **IF YOU HAVE ANY PAIN, SHORTNESS OF BREATH, OR DISCOMFORT CONSULT YOUR PT AT IMGPT (610-944-8140) BEFORE PROCEEDING!**
- Important: in the presence of peripheral neuropathy, it is very important to check your feet constantly for the presence of a foot wound!

Week 1	Week 12
Toe crunches, 2 x 10 repetitions	Toe crunches, 2 x 35 repetitions
Single-leg stand with one-hand support, 2 x 30 sec.	Single-leg stand with no hand support, 2 x 30 sec.
Step sideways and step backward, 2 x 10 repetitions for each direction	Step over 5 cones, 3 times
2-leg heel stands (toes up), 2 x 10 repetitions	2-leg heel stands (toes up), 2 x 20 repetitions
2-leg toe raises (heels up), 2 x 10 repetitions	Single-leg toe raises (heels up) 2 x 40 repetitions
Sit-to-stand maneuver, 2 x 5 repetitions	Sit-to-stand maneuver, 2 x 20 repetitions
Step ups with one-hand support, 2 x 10 repetitions	Climb 2 flights of stairs, 2 times
14-minute backward walk on treadmill	24-minute backward walk on treadmill

### Benefits of walking backwards

- Improves lower extremity strength and balance
- Decreased ground reaction forces during walking
- Improves proprioception and balance control
- Allows for even distribution of plantar pressure (important for DM and peripheral neuropathy)

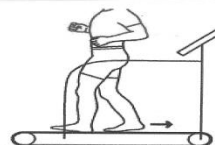
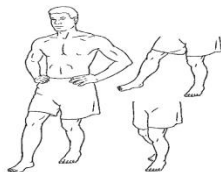
Routine For:  
Created By: Eric Parrish / Chris Gordos

Oct 08, 2014

#### ANKLE / FOOT - 44: Balance: Three-Way Leg Swing

Stand on left foot, hands on hips. Reach other foot forward 10 times, sideways 10 times, back 10 times. Hold each position 3-5 seconds. Relax.

Repeat 2 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.



14-minute backward walk on treadmill  
Progress to 24-minute backward walk on treadmill  
<http://www.medicalfitnesspros.com/back-pain-exercises-in-katy-tx>

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#### ANKLE / FOOT - 11 Toe Curl: Bilateral

With both feet resting on towel, slowly bunch up towel by curling toes. Hold 5 seconds.  
Repeat 10 times per set. Do 2 sets per session.  
Do 2 sessions per day.

#### ANKLE / FOOT - 22 Toe Raise (Standing)

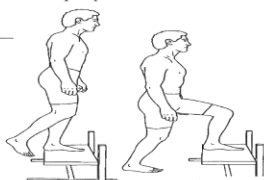
Rock back on heels.

Repeat 10 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.

#### HIP / KNEE - 52 Step-Down / Step-Up

Stand on stair step or 12 inch stool. Slowly bend left leg, lowering other foot to floor. Return by straightening front leg.

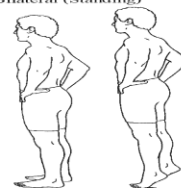
Repeat 10 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.



#### ANKLE / FOOT - 20 Heel Raise: Bilateral (Standing)

Rise on balls of feet.

Repeat 10 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.



#### TRUNK STABILITY - 31 Sitting to Standing

With straight back, tighten stomach, place right leg back under chair, lean slightly forward and stand.

Repeat 5 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.



#### ANKLE / FOOT - 15 Balance: Unilateral

Attempt to balance on left leg, eyes open. Hold 30 seconds.

Repeat 2 times per set.  
Do 2 sets per session.  
Do 2 sessions per day.

— Perform exercise with eyes closed.

