



the Foundation for Peripheral Neuropathy

Welcome!

Physical Exercise and Peripheral Neuropathy

Tuesday, May 4, 2021

We will begin our presentation shortly.

the Foundation for Peripheral Neuropathy

www.foundationforpn.org



the Foundation for Peripheral Neuropathy



Nancy Frohman

*Director of Development & Marketing
the Foundation for Peripheral Neuropathy*



the Foundation for Peripheral Neuropathy

Before We Begin



This presentation is being recorded. The recording link will be emailed to you so you can view it again later.



Submit your questions anytime via the Questions Box. We will try to answer them during this webinar.



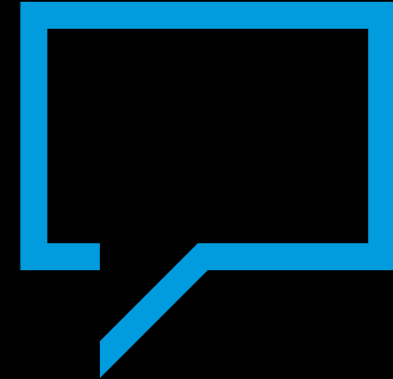
If you are having trouble with the audio using your computer, you can dial in by phone (check your email for dial-in instructions).



the Foundation *for* Peripheral Neuropathy



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Physical Exercise in Peripheral Neuropathy

Sarah Boyd, PT, DPT

the Foundation for Peripheral Neuropathy
Tuesday, May 4

Disclosures

Relevant Financial Relationship(s)

None

Off Label Usage

None

LEARNING OBJECTIVES

1. Identify 3 key benefits of physical exercise for peripheral neuropathy.
2. Identify factors that impact ability to exercise and strategies to maximize success.
3. Identify 2 exercises to address strength, flexibility, balance, aerobic, and core.

Poll Question #1

Where do you currently exercise?

- Gym
- Home
- Outside
- None of the above - I don't exercise

Poll Question #2

In my exercise routine, I...

- Currently work with a physical therapist or trainer
- Have worked with a physical therapist or trainer in the past
- Use home gym equipment such as a stationary bike or weights
- None of the above

Poll Question #3

What are you most concerned about when increasing daily activity and exercise?

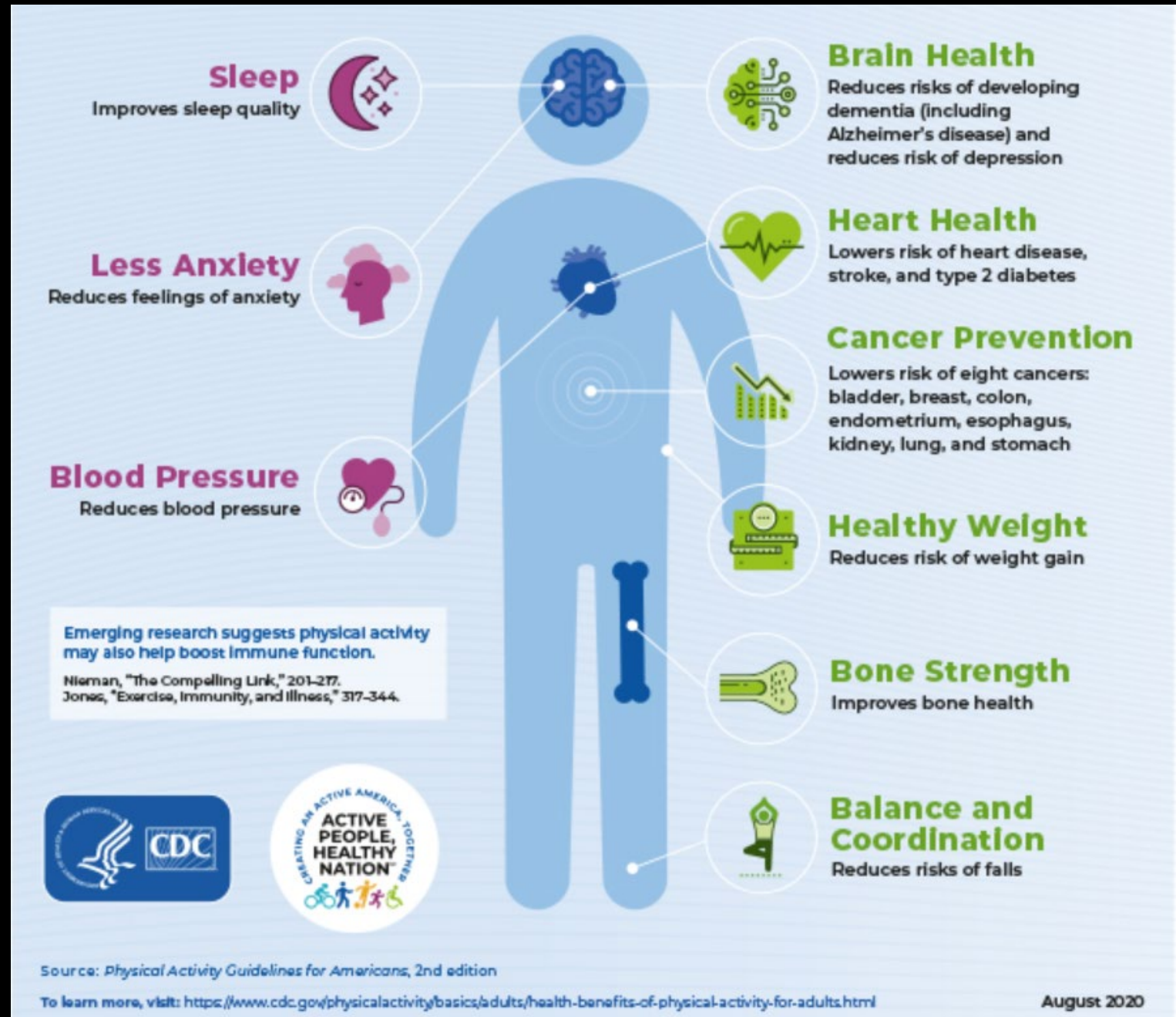
- Pain
- Safety
- Unsure of what I should do

1

Identify 3 key benefits of physical exercise for peripheral neuropathy.

Why Exercise^{1,2}

- Reduce risk of chronic diseases
- Mood boost
- Improve sleep hygiene
- Brain health and memory
- Bone health
- Physical function



Exercise in Peripheral Neuropathy

Protocol for evaluation of the effect of exercise on neuropathic symptoms, physical therapy in therapeutic exercise nerve function, and cutaneous innervation in people with diabetic peripheral neuropathy

diabetic polyneuropathy trial



Patricia M Kluding¹, Mamatha Pasnoor, Rupali Singh, Stephen Jernigan, Kevin Farmer, Jason Rucker, Neena K Sharma, Douglas E Wright

Patricia M Kluding¹, Katia Molatore¹

Affiliations + expand

Renan L Monteiro, Silco Bis 5, Is

PMID: 22717405 PMCID: P

Aerobic exercise improves measures of vascular health in diabetic peripheral neuropathy

What does this mean for me?

It's never too late - balance and improves functional performance



Sandra A Billinger¹, Jason-Flor V Sisante¹, Abdulfattah S Alqahtani¹, Mamatha Pasnoor

Physical Training and Activity in People With Diabetic Peripheral Neuropathy: Paradigm Shift

Physical Therapy



Patricia M Kluding, Sonja K Bareiss, Mary Hastings, Robin L Marcus, David R Sinacore, Michael J Mueller

PMID: 27445060 PMCID: PMC6256941 DOI: 10.2522/ptj.20160124

DOI: 10.3109/00207454.2016.1144056

Patricia M Kluding¹, Melaku Hailu Temesgen¹, Gebresilassie Kahsay

PMID: 31046719 PMCID: PMC6498676 DOI: 10.1186/s12885-019-5522-7

DOI: 10.2147/DMSO.S261175

Exercise in Peripheral Neuropathy

- Evidence primarily in diabetic or chemo-induced peripheral neuropathy
- Highlights:
 - Exercise targets central and peripheral nerve locations that are involved in pain³
 - Induces molecular and cellular changes to help with neural health
 - Increases endogenous opioids in our nervous system
 - Reduces inflammatory markers
 - Nerve health and preservation⁴
 - Reduces fear of falling⁵
 - Mobility measures improve^{6,7}
 - Decrease in fatigue⁶

Exercise in Peripheral Neuropathy

- Weightbearing activities safe and feasible
 - Individuals with diabetic PN found to increase weightbearing without an increased incidence of injury⁶ or foot ulcers^{8,9}
- Seek medical clearance if you have risk factors for greater skin breakdown¹⁰
 - Check feet daily and frequently!
 - Non-weightbearing with foot injury or open sore⁹

Variable	Risk Factor
Skin	History of ulcer ⁸⁷ Presence of callus, blister, or reddened areas Dry or cracked skin Distal hair loss Overgrown and thickened toenails
Nervous system ⁸⁹	Loss of protective sensation (inability to feel 5.07 monofilament, absent Achilles tendon reflex, inability to perceive vibration)
Musculoskeletal system	Foot deformity ^{90,91} Muscle weakness ⁹² Limited ankle mobility (<10°) and toe joint mobility (<50°) ⁷⁰ Inappropriate footwear (incorrect size, insufficient protection of the foot)
Vascular system	Impaired distal blood flow (absent distal pulses)

2

Identify factors that impact ability to exercise and strategies to maximize success.

Factors to Consider...

Neuropathic
pain

Weakness

Fatigue

Falls Risk

“Elephant in
the room”

Neuropathic Pain

- Requires a multi-disciplinary approach¹¹
 - Medication
 - Nerves also like movement!
- Food for thought⁴
 - Individuals who do not exercise have an increased risk of developing neuropathic pain
 - No significant increase in neuropathic pain in DPN from baseline to post-intervention
- Limited to modest evidence showcasing exercise reduces neuropathic pain...
 - Exercise-induced hypoalgesia³
 - Decrease aspects of neuropathic pain⁴

Navigating Neuropathic Pain and Exercise

- Transcutaneous electrical nerve stimulation^{12,13}
- Topical treatments¹¹
 - Lidocaine patches
 - High-concentration capsaicin ointment
- Warm up!
 - Contrast baths^{*14,15}
- Deep breathing or other relaxation methods
- Reduce irritating stimuli to improve activity tolerance
 - Non-weightbearing – sitting or laying down
 - Remove socks/shoes **IF** non-weightbearing



Navigating Weakness and Fatigue

- Apply submaximal exercise principles
 - Calculated as less than 85% of your predicted maximal heart rate (220-age)
 - Unreliable in chronic conditions or if taking medications that impact heart rate response¹⁶
- General principles:
 - Moderate resistance to body weight
 - Spread exercise throughout the day
 - Use self-assessments to monitor intensity



Exercise Intensity Rating Scales

BORG RPE
Scale[©]

Talk Test[©]

BORG Rating of Perceived Exertion (RPE)[©]

How you might describe your exertion	Borg rating of your exertion	Examples (for most adults <65 years old)
None	6	Reading a book, watching television
Very, very light	7 to 8	Tying shoes
Very light	9 to 10	Chores like folding clothes that seem to take little effort
Fairly light	11 to 12	Walking through the grocery store or other activities that require some effort but not enough to speed up your breathing
Somewhat hard	13 to 14	Brisk walking or other activities that require moderate effort and speed your heart rate and breathing but don't make you out of breath
Hard	15 to 16	Bicycling, swimming, or other activities that take vigorous effort and get the heart pounding and make breathing very fast
Very hard	17 to 18	The highest level of activity you can sustain
Very, very hard	19 to 20	A finishing kick in a race or other burst of activity that you can't maintain for long

<https://www.hsph.harvard.edu/nutritionsource/borg-scale/>

Talk Test[©]

INTENSITY LEVEL	CAN YOU TALK?
LIGHT	You can sing or carry on a conversation with little effort
MODERATE	You can speak in full sentences but cannot sing
VIGOROUS	You can only speak a few words at a time
MAXIMUM EFFORT	You can speak zero to one word at a time

<https://fitnessgoals.com/guide/ultimate-guide-fitness/>

Monitor Symptoms AFTER Exercising...

Excessive fatigue

Greater pain

Muscular cramping and soreness

Muscular weakness

Functional changes

If you experience any of these, you may be exercising too hard...
adjust duration, intensity, or resistance/repetitions.



Navigating Falls Risk and Exercise

- Reduce falls risk while exercising:
 - Use a mobility device or hand support
 - Wear supportive, properly fitting shoes
 - Wear lower leg orthoses if you use for walking
 - Body positioning
 - Corner of room with chair or walker in front
 - In front of bed or couch with chair or walker
 - Family supervision
 - If still concerned, remain seated or perform “ground” exercises in bed!

What about the elephant in the room...



Activity Guidelines¹⁷

Moderate-intensity aerobic activity

Anything that gets your heart beating faster counts.



AND

Muscle-strengthening activity

Do activities that make your muscles work harder than usual.



Tight on time this week? **Start with just 5 minutes.** It all adds up!

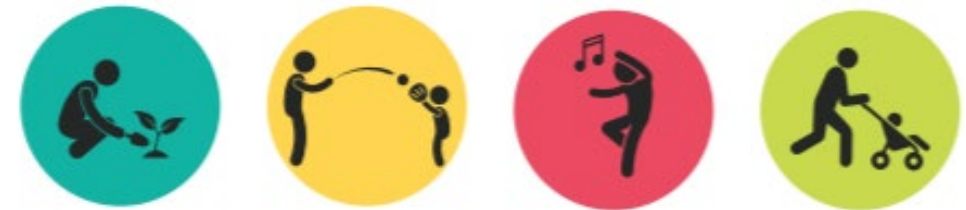
Non-exercise activity thermogenesis – “N.E.A.T.”¹⁷

- All activities that you do in a day ADD UP!
- “N.E.A.T” ideas:
 - If able, park further from the store
 - Move during each commercial break
 - Walk and talk
 - Bluetooth speakers or speaker phone for safety
 - Clean one room a day
 - Alternate standing and sitting

Whatever gets you moving!

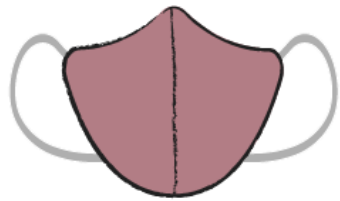


Even things you have to do anyway



Even things that don't feel like exercise

COVID-19 and Gym Safety¹⁸



Cloth face covering



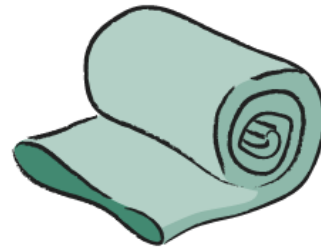
Disinfectant wipes



Hand sanitizer with at least 60% alcohol



Water bottle



Towel

- Use online reservations/check-in
- Wear a cloth face mask
- Wash hands frequently (20 seconds!) or use hand sanitizer with at least 60% alcohol
- Disinfect equipment before and after use
- Remain 6 feet away from others
- Skip the locker room
- Limit high-intensity activities to outdoors or increase distance if indoors

Return to Exercise After COVID-19^{19,20}

- Depends on severity of your COVID-19 illness or ongoing symptoms
 - Recommend to obtain clearance from your medical care team
- In general:
 - SLOW and GRADUAL progression
 - Stop if the following symptoms occur and consult with medical team:
 - Chest pain
 - Shortness of breath
 - Fever
 - Headache
 - Excessive fatigue
 - Heart rate fluctuations



3

Identify 2 exercises to address strength, flexibility, balance, aerobic, and core.

Exercise is Medicine

** Please consult with a healthcare provider before beginning a new program.



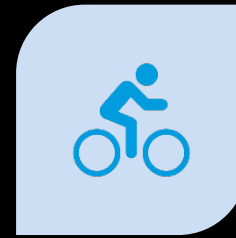
STRENGTH



BALANCE



FLEXIBILITY



AEROBIC



CORE

Strength: Sit to Stands

- How to:
 - Scoot closer to edge of chair
 - As you stand, think "nose over toes"
 - Immediately upon standing:
 - Find balance
 - Stand TALL – hips under shoulders!
 - Slowly sit down
- Modifications:
 - Change height of surface
 - Use a squishy surface for balance/core



Strength: Bottom Raise

- How to:
 - Lay on bed or ground
 - Bend legs and position feet close to bottom
 - Raise bottom and slowly lower
- Modifications
 - If low back pain, do not raise as high
 - If hamstrings cramp, position feet closer to bottom
 - Squeeze a ball/pillow between knees
 - Hold position



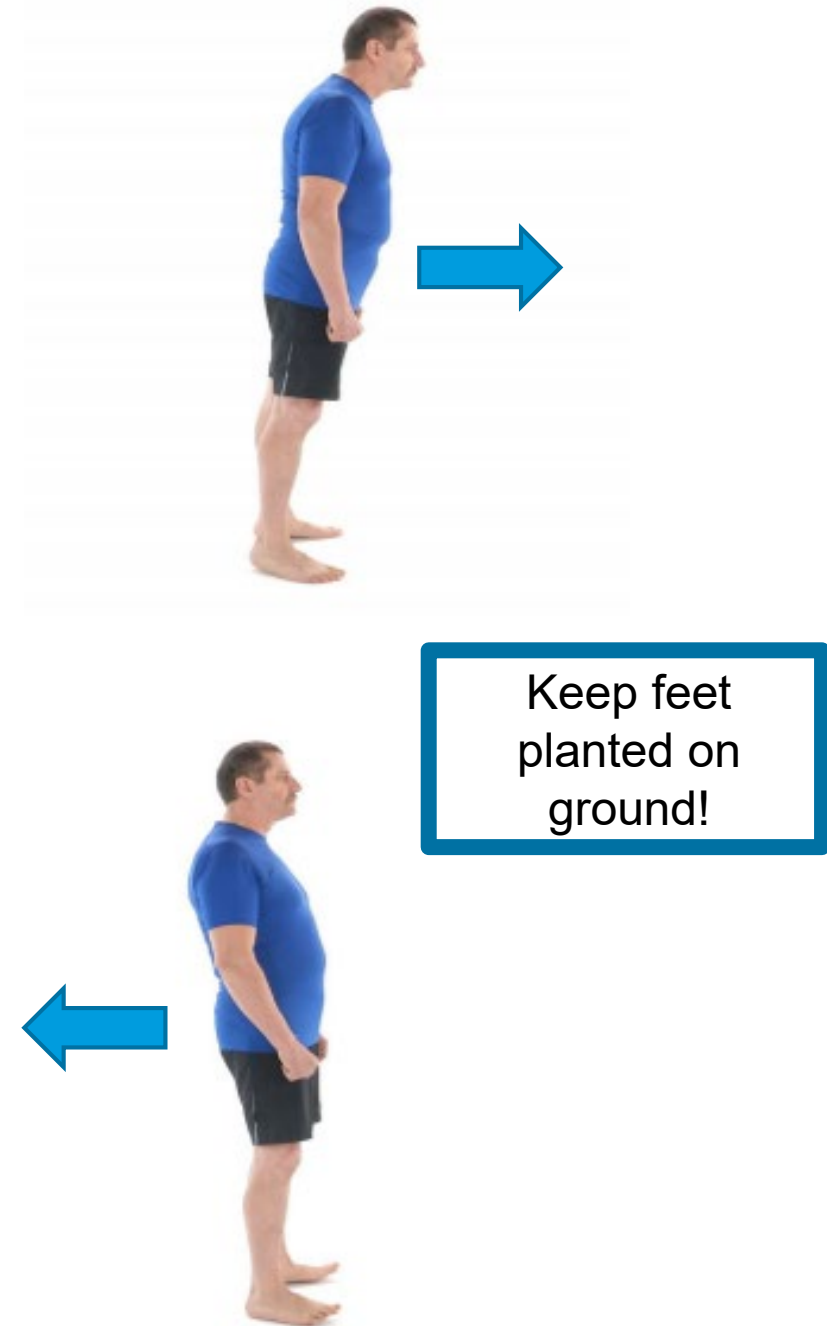
Balance: Side Stepping

- How to:
 - Stand next to countertop
 - Step sideways along length of counter
 - Do not lean over!
 - Do not slide feet along floor
 - Place each foot as softly as you can
- Modifications
 - Adjust hand support
 - Start with two hands, then one hand, then fingertip support, to hover
 - Pretend as if stepping over a hurdle



Balance: Ankle Sway

- How to:
 - Stand next to support surface
 - Find your “center”
 - Pressure or weight at ball of foot
 - Shift weight towards toes and then heels
 - Keep shoulders and hips together!
- Modifications
 - Adjust hand support
 - Start with two hands, then one hand, then fingertip support, to hover
 - Eyes open to eyes closed



Flexibility: Nerve Flossing

- How to:
 - Sit on chair with hands behind back
 - Slouch!
 - Gently and slowly straighten and bend knee
 - Continuous movement – no holds!
- Modifications
 - Perform laying down on back
 - Hold back of knee with hands
 - Incorporate ankle movements
 - When knee is straight, lift toes to face and then point down before returning foot to floor



Flexibility: Calf Stretch

- How to:
 - Scoot closer to edge of chair
 - Wrap towel or sturdy belt around foot
 - Place foot in front of you
 - Pull on towel or belt to bring foot towards shin
 - Keep heel on the ground!
- Modifications
 - Place foot on stool or ottoman
 - Support leg on recliner leg rest or couch



Aerobic Training

- Focus on low-impact options
 - Stationary bike
 - Floor bike
 - Use legs OR place on table to use arms
 - Elliptical – recumbent or standing
 - Walking versus treadmill
- Aim for 30-45 minutes, 2-4x/week
 - Spread throughout the day versus all at once
 - Three bouts of 10 minutes



Core: Knee Press

- How to:
 - Lay on bed or ground with legs bent
 - Lift left knee up to have a 90° angle at hip
 - Press left hand into left knee to create resistance and hold for 3-5 seconds
 - Lower leg to starting position
 - Repeat on other side
- Modifications
 - Perform while sitting in a chair
 - Lift both knees up and keep elevated



Core: Straight Leg Raise

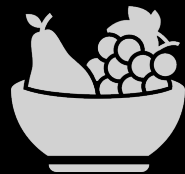
- How to:
 - Lay on bed or ground
 - Bend one leg while other remains straight
 - Tighten knee and lift leg to be parallel to opposite thigh
 - Slowly lower to softly place on surface
- Modifications
 - Eyes open to eyes closed
 - Do not lower to bed or ground
 - Keep leg elevated in air and perform mini circles



“A La Carte”



Overall Wellness



Nutrition



Exercise



Tobacco and
alcohol



Stress
management



Sleep



Healthy
relationships

The “Big Picture”

- Exercise!
 - Multi-faceted approach
 - Daily flexibility
 - 2-4 days of aerobic activity
 - 2-3 days of strength training
 - Sprinkle in balance!
 - Weightbearing is safe!*
- Apply submaximal exercise principles
 - Moderate intensity is safe
 - Symptoms are your guide
- Remember safety!
- Seek physical therapy consultation for further guidance and recommendations

“ChoosePT” – www.choosept.com



- Find a PT**
- Symptoms & Conditions
- Health & Prevention
- Why Physical Therapy?
- Safe Pain Management
- For Patients

Find a PT

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Search Criteria

City	<input type="text" value="City"/>	State	<input type="text" value="State"/>	Zip Code	<input type="text" value="Zip Code"/>	Distance	<input type="text" value="Distance From City /"/>
First Name	<input type="text" value="First Name"/>		Last Name	<input type="text" value="Last Name"/>			
Setting	<input type="text" value="Setting"/>						
Practice Focus	<input type="text" value="Practice Focus/Treatment"/>						
Find By Specialist	<input type="text" value="Neurologic"/>						

Press space bar to see the list or start typing the practice focus. ⓘ

Limit results to only Board-Certified Specialists.

A **BODY**
IN MOTION
TENDS TO
STAY
IN MOTION

#SCIENCE MATTERS



LIFE IS LIKE

riding a bicycle.

TO KEEP YOUR
BALANCE,

You must keep 
moving

Since 1879

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the Foundation *for* Peripheral Neuropathy

Questions?



the Foundation for Peripheral Neuropathy

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Do you like us? Please consider supporting us so that we can continue to fulfill our mission of improving the lives of people living with Peripheral Neuropathy. You can give securely online, via mail or via phone. Every dollar matters!

Can we help with anything else? Call 847-883-9942 or email info@tffpn.org. You may also mail inquiries and donations to *the* Foundation for Peripheral Neuropathy at 485 E. Half Day Road, Suite 350, Buffalo Grove, Illinois 60089.