Neuropathy: Establishing a safe and effective exercise program
Corey Swartz, Director of Therapy
Lindsay Keller, DPT
HealthSouth Rehabilitation Hospital of Austin

Benefits of Exercise
- Increase blood flow to help reduce cramping
- Improve strength to prevent muscle atrophy and improve stability
- Preserve range of motion in affected body parts
- Reduce pain and improve sensation
- Relieve Stress
- Decrease occurrence of depression
- Improved glycemic control for those with diabetes

Importance of Exercise for Individuals with Neuropathy Patients
- Muscle paralysis due to not using limbs regularly and muscle wasting
- Increased risk of falls or other injuries due to:
  - Lack of muscle control
  - Decreased sensitivity to heat, cold, and pain
  - Decreased proprioception thresholds.
Considerations Prior to Starting Exercise
- Clearance from physician
- Safety
- Balance
- Mobility
- Medication side effects
- Intensity, type, duration, frequency, and rate of progression of physical activity

Components of Exercise
- Resistance/Strength Training
- Cardiovascular Training
- Flexibility/Stretching
- Balance

Resistance/Strength Training
- Can include weight lifting, circuit training, use of resistance bands, and leveraging the body's own resistance in order to build muscle
- Helps strengthen and build weak muscles and increases circulation and coordination
- Examples:
  - Lower extremities:
    - Calf raises and leg extensions are good examples of resistance-training exercises that build muscles in these areas.
  - Upper extremities:
    - Arm curls, push-ups, and slow-speed push-ups can be beneficial. If you are still using weights, start slowly to prevent post-exercise pain and discomfort.
Cardiovascular Training
- Increases heart rate, breathing and works muscles
- Burns Calories, helps maintain healthy weight
- Stimulates blood flow
- Types of Cardiovascular Training: Low impact water aerobics, walking program, bicycle, elliptical

Stretching/Flexibility
- Keeps joints flexible and can be a good warm up to other exercise.
- Used to help reduce tingling/numbness associated with neuropathy
- Hold stretches for at least 30 seconds-1 minute
- Perform 5-6X/throughout the day
- Types include: yoga, tai chi

Balance
- Reduces risk of fall or injury
- Older muscles are smaller and slower and respond less efficiently when needed to recover or brace oneself
- Types of exercises: yoga, tai chi
- Examples can include all typical exercises done in standing using arms to support if necessary.
Intensity

- Monitor Heart Rate
- Unless taking Beta blocker
- RPE Scale
  - Work recommends that patients strive to reach a moderate-range RPE (~7) gradually over 2-4 weeks
  - Exercise should be terminated if a patient is unable to continue talking and exclaiming, to maintain a comfortable pedaling frequency.

Rating of Perceived Exertion
RPE Scale
0  Nothing at all
1.5  Very, very weak
2  Weak
3  Moderate
4  Somewhat strong
5  Strong
6
7
8
9  Very strong
10  Very, very strong
Maximal

Duration

- Determined by individual tolerance
- Participation in individualized exercise screen with skilled healthcare professional (PT) may assist in determining appropriate duration.
- The intensity of the exercise should not be increased to compensate for shortened exercise sessions

Frequency

- The U.S. Surgeon General now recommends for all people that physical activity be performed on most, if not all, days of the week to obtain health-related benefits
- In order to maintain achieved gains, perform exercises 5-7 days per week
Progression of Exercise
- Increase frequency of activity before increasing intensity and duration.
- The duration of physical activity should be gradually increased to accommodate the patient's functional capacity and clinical status.
- Intensity should be increased very slowly and cautiously to minimize the risk of any dangerous cardiovascular events, musculoskeletal injuries, and/or relapse.

Activities to Avoid
- Activities requiring rapid changes in body position
- Activities that cause rapid change in HR or BP (running, lifting weights)
- Activities that compromise safety

Let's Begin Exercising
Stretching / Flexibility
- Shoulder Rolls
- Pectoralis Minor Corner Stretch
- Hamstring Stretch
- Calf Stretch
- Join a Yoga class

Resistance/Strength Training
- Toe Crunches
- Calf Raises
- Toe Taps- Seated or Standing
- Straight Leg Raise
- Bridges
- Clams
- Sit to stands

Resistance/Strength Training
- Wall push-ups
- Scapular Retraction
- Bicep Curls
- Triceps
- Wrist extension/flexion
Balance
- Stand with feet together
- Stand with one foot in front of the other
- Stand on a cushion/pillow (do on carpet)
- Single leg step-ups
- Join a Tai Chi class
- When you feel safe, progress these exercises by closing your eyes.

Cardiovascular
- High Step Marching
- Walking for 30 min., 5 days a week. Aim for an RPE of 13 (somewhat hard)
- Bicycle- try a stationary bike if you have poor balance.
- Water aerobics or swimming
- If you'd also like to lose weight while getting in shape, increase your aerobic activity to 45 to 60 minutes daily and follow a sensible diet.

One Final Note...
- Neuropathy reduces sensation in the affected parts of the body
- Always visually examine these areas for blisters or signs of irritation.
- Blisters caused by snug shoes can quickly become infected if they are not noticed and treated.
- Carefully select your footwear, including socks, shoes and orthotics if necessary, to ensure safe exercising.
CERVICAL SPINE - 22A Strengthening: Shoulder Rolls

Shrug shoulders up and down, forward and backward.

Repeat __30__ times per set.
Do __1__ sets per session.
Do __1__ sessions per day.

CERVICAL SPINE - 24 Flexibility: Corner Stretch

Standing in corner with hands just above shoulder level and feet __12__ inches from corner, lean forward until a comfortable stretch is felt across chest.
Hold __30__ seconds.

Repeat __3__ times per set.
Do __1__ sets per session.
Do __1__ sessions per day.

HIP / KNEE - 38 Stretching: Hamstring (Supine)

Supporting right thigh behind knee, slowly straighten knee until stretch is felt in back of thigh. Hold __20__ seconds.
Repeat __3__ times per set. Do __1__ sets per session.
Do __1__ sessions per day.

HIP / KNEE - 41 Stretching: Gastroc

Stand with right foot back, leg straight, forward leg bent. Keeping heel on floor, turned slightly out, lean into wall until stretch is felt in calf.
Hold __30__ seconds.

Repeat __3__ times per set.
Do __1__ sets per session.
Do __1__ sessions per day.

ANKLE / FOOT - 11 Toe Curl: Bilateral

With both feet resting on towel, slowly bunch up towel by curling toes. Hold __5__ seconds.
Repeat __30__ times per set. Do __1__ sets per session.
Do __1__ sessions per day.

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

Rise on balls of feet.

Repeat __30__ times per set.
Do __1__ sets per session.
Do __1__ sessions per day.

Copyright © 1999-2009, VHI
ANKLE / FOOT - 22 Toe Raise (Standing)

Rock back on heels.

Repeat ___30__ times per set.
Do ___1___ sets per session.
Do ___1___ sessions per day.

HIP / KNEE - 17 Strengthening: Straight Leg Raise (Phase 1)

Tighten muscles on front of right thigh, then lift leg ___6__ inches from surface, keeping knee locked.
Repeat ___15___ times per set. Do ___2___ sets per session.
Do ___1___ sessions per day.

TRUNK STABILITY - 9 Bridging

Slowly raise buttocks from floor, keeping stomach tight.
Repeat ___15___ times per set. Do ___2___ sets per session.
Do ___1___ sessions per day.

HIP / KNEE - 54 Strengthening: Hip Abductor – Resisted

With band looped around both legs above knees, push thighs apart.
Repeat ___15___ times per set. Do ___2___ sets per session.
Do ___1___ sessions per day.

HIP / KNEE - 77 Functional Quadriceps: Sit to Stand

Sit on edge of chair, feet flat on floor. Stand upright, extending knees fully.

Repeat ___15___ times per set.
Do ___2___ sets per session.
Do ___1___ sessions per day.
**SHOULDER - 102 Scapular Retraction:**
Unilateral (Standing)

With arms at sides, move right shoulder blade down and toward opposite side hip.

Repeat _15_ times per set.
Do _2_ sets per session.
Do _1_ sessions per day.

**HAND - 58 Elbow Flexion: Resisted**

Sit in chair with resistive band secured at base of armrest, right elbow straight. Bend elbow.

Repeat _15_ times per set.
Do _2_ sets per session.
Do _1_ sessions per day.

**HAND - 57 Elbow Extension: Resisted**

Sit in chair with resistive band secured at armrest and right elbow bent. Straighten elbow.

Repeat _15_ times per set.
Do _2_ sets per session.
Do _1_ sessions per day.

**HAND - 63 Wrist Flexion: Resisted**

With right palm up, _1_ pound weight in hand, bend wrist up. Return _slowly_.

Repeat _15_ times per set. Do _2_ sets per session.
Do _1_ sessions per day.

**HAND - 64 Wrist Extension: Resisted**

With right palm down, _1_ pound weight in hand, bend wrist up. Return _slowly_.

Repeat _15_ times per set. Do _2_ sets per session.
Do _1_ sessions per day.

**STANDING STATIC - 10**

Eyes Open: Feet Together

Stand with feet together. Open eyes and visualize upright position. Perform with arms at sides.

Hold _30_ seconds.
Repeat _3_ times per session.
Do _1_ sessions per day.
STANDING STATIC - 12
Eyes Open: Feet Heel-Toe "Tandem"

Stand with right foot directly in front of the other. Open eyes and visualize upright position. Perform with arms at sides.

Hold ___30___ seconds.
Repeat ___3___ times per session.
Do ___1___ sessions per day.

STANDING STATIC - 5
Feet Apart (Compliant Surface)

Stand on ___pillow___ with feet shoulder width apart. Look straight ahead at stationary object. Perform with arms ___at sides___.

Hold ___30___ seconds.
Repeat ___3___ times per session.
Do ___1___ sessions per day.

STANDING DYNAMIC - 15
Step-Ups: Forward

Leading with right leg, bring both feet onto a ___6___ inch step. Return to starting position, leading with right leg.

Repeat ___15___ times per session.
Do ___2___ sessions per day.

___Repeat in dimly lit room.
___Repeat with eyes closed.