

Physical therapy for adults diagnosed with HSP

Dr. Jørgen Nielsen, Ph.D., Chief Medical Consultant at Denmark's National Hospital and neurologist, Dr. Chantal Tallaksen of Norway, have the following comment: Patients with HSP should always begin a training session with muscle warm-ups and stretching exercises, because of the spasticity. Warm-ups and stretches should be supervised by a physical therapist before going on to the training exercises.

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This training method, and its underlying principles, have been developed and tested in work with healthy persons, or persons with a diagnosis similar to HSP patients. Studies of the nervous and musculoskeletal systems, as well as readings in HSP and similar research, have been here combined with physiotherapeutic reasoning and experiences to form the basis of this training program.

General principles

- Individualization by physical therapist or other specialist
- Challenge: more demanding than normal daily activities
- Enjoyment, fun
- Specific training for skills needing improvement (gait, balance, fine motor functions)

Types of exercises

1. Endurance training
 2. Balance
 3. Strengthening
 4. Stretching / flexibility
 5. Breathing / relaxation
 6. Warm-water training
 7. Functional, daily-activity exercises
 8. Gait exercises
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Appendix 1: Principles and foals of endurance training

1. The National Board of Health recommends daily 30 minutes of physical activity of moderate to high intensity.
2. To preserve and increase physical fitness.
3. To help prevent e.g. circulatory diseases, stress, muscular and skeletal diseases.
4. To reduce high blood pressure, help prevent overweight, improve psychic and social wellbeing.

Training suggestions:

Arm bike, rowing machine, treadmill, cross- or arctrainer, cycling and spinning.

Appendix 2: Principles and goals of balance training

1. To prevent falls
2. Challenge the person, give a feeling of greater security
3. Challenge at individual levels
4. Variation and unexpected components are important
5. Progression in different ways: unstable foundation, narrow foundation, closed eyes, mat, pillow, mobile foundation (big ball, small ball)
6. Train balance sitting, standing, walking

Training suggestions:

Different balance exercises on changing foundation, moving the head, closing the eyes.

Many balance exercises on one leg, as part of daily routines

Train fall-reactions (standing - fall forward - moving the foot quickly to regain balance)

Sitting on a ball of various sizes

Walk on line, cross-walking, broad-walking, narrow-walking and taking long steps

Appendix 3: Principles and goals of strength training

1. Exercise machines give specific and measurable training of individual muscle groups

2. Weight cuffs / dumbbells
3. Elastic band / exercise bands
4. May be integrated into functional exercises e.g. getting up / sitting down etc.
5. Strength training means training with one or more weights, max 15 times
6. Strength endurance training means training with one or more weights, more than 15 times

Training suggestions:

Strengthening training machines (leg-pressure, abductor, back machine, pull to breast/lateral pull

Strengthening exercises with weights

Functional exercises (up and down from chair and floor)

Appendix 4: Principles and goals for stretching and mobility exercises

1. Important for everyone no matter functional level and age
2. Muscle-tone / spasticity
3. Especially on tense musculature / pain / stiffness
4. Attention to wheelchair users who get short muscles in hips and hollows of the knees
5. Personal stretching
6. Stretching by a physical therapist
7. Active / dynamic mobility exercises with the joints to extreme positions

Training suggestions:

Dynamic mobility exercises for the whole body including back, shoulders, hip flexers, adductors (inwards) and the legs in general

Stretching of the hollows of the knees

Mobility exercises for the mobility of the ankles (the dorsal flexion) to improve the gait functions

Appendix 5: Breathing and relaxing exercises

1. Breathing exercises
2. Comfortable positions of rest
3. Balance between activity and rest

Appendix 6: Training functions in warm water

1. The water gives stability
2. Strengthening exercises
3. Endurance exercises
4. Mobility and stretching exercises
5. Heat: alleviates the pain
6. Fun for everyone

Appendix 7: Functional exercises resembling common daily activities

Training suggestions:

Getting up and down from a chair (e.g. using a test, which should be evaluated and re-tested)

Getting up and down from the floor

Arm exercises for lifting of various things in the home including shopping and kitchen utensils.

Appendix 8: Gait training

Typical changes in the gait function for people with HSP

- Walk is narrow, almost in line with the feet in front of each other giving minimal supporting surface
- Walking on the toes with the weight in front of the body's center of gravity
- Reduced hip flexion and leg lifting at the risk of stumbling over one's toes
- Reduced ankle flexion and placing of the heel at the risk of stumbling over one's toes
- Inward moving of knees and feet

Training with focus on:

- Lifting the leg - activating the hip flexor
- Walking broad - and not putting the feet in front of each other
- Placing the heel with a stable gravity point in the center line of the body - avoiding walking on the toes

Training suggestions to strengthen the muscles which are used in the gait functions:

- 1. Squat with focus on the knees pointing forward in the direction of the 2nd toe (good alignment in the lower part of the body)*
- 2. Leg pressure and abduction exercises (+ general training of the outer side of the hip - gluteus medius)*
- 3. Exercises with training elastic bands for hip abduction - standing with the elastic band around the ankles and moving the leg outwards*
- 4. Increase the ankle flexion standing: the heels touching the floor - move the knees as much forward as possible*
- 5. Stretching of the abductors e.g. in a machine or with a physical therapist*

This paper is prepared by physical therapist Camilla Hansen based on "Training for adults with HSP" by physical therapist Cecilie Fromholt Olsen, Frambu, Norway.