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The Active Passive Trainer (APT) is a family of unique exercise rehabilitation trainers for upper or lower limbs. The APT offers benefits that rehabilitation professionals expect from a medical device that is quality engineered and FDA and CE registered. The APT is commonly used in physiotherapy clinics in the USA and around the world and over the years, multiple clinical studies have confirmed the benefits of the trainer.

The wide range of exercise options makes the APT suitable for use by healthy and independent senior citizen for the maintenance of fitness and physical well-being. It is also designed for the physically impaired, as part of a planned rehabilitation program and as a supplement to physiotherapy.

The APT combines both passive and active exercise by using physical effort in conjunction with the electrical operation of the motor. Offering a wide range of advanced features, the APT trainer helps passive users recovering from injury, suffering from muscle atrophy or confined to a wheelchair, maintain muscle tone and improve blood circulation and stamina. The trainer also challenges active users with five levels of resistance for active exercising. This makes the trainer extremely helpful for movement rehabilitation, improving strength, stamina and fitness.

APT Trainers are now available for home use so patients can continue rehabilitation, without having to leave home.

# EXERCISE FOR THE ELDERLY

# + APT Rehabilitation Trainers

## TOTAL WORKOUT FOR ARMS AND LEGS

### Increases Range of Motion

The APT trainer allows the performance of repetitive movements of the upper and lower extremities. Using the Passive and Passive Assist modes allows to moderately increase the passive range of motion of the major joints. Once obtained, a novel range of motion should be followed by Active Mode training for muscle conditioning.

### Reduces Spasms

The APT trainer Passive and Passive Assist modes facilitate slow and controlled rhythmic movements of the extremities. Users with increased muscle tone due to neurological conditions may benefit from using these modes. If needed, accessories providing additional support for the limbs may be added. Furthermore, increased muscle tone during movement may be a result of weakness, therefore training with

the Passive Assist and Active mode may increase muscle strength and reduce the demanded effort performing movements.

### Improves Walking Capabilities

Training with the APT helps to improve walking distance and speed. This improvement is achieved mainly by improving the aerobic capacity of the circulatory and respiratory systems, along with increasing the major muscles' resistance to fatigue.

### Increases Muscle Strength

The APT trainer enables muscle strength training by concentrically flexing and extending the main joints of the extremities, using five distinct levels of resistance. Additionally, trunk muscle strength and postural control can improve while sitting unsupported.



## APT Trainers for Arms and Legs



### Clinical Applications

- Elderly / geriatric
- Spinal cord injury (SCI)
- Orthopedic pathologies
- Parkinson's disease (PD)
- Multiple sclerosis (MS)
- Post-polio syndrome
- Post-cardiac rehabilitation
- Post-operative therapy
- Spina bifida
- Cerebrovascular accident (CVA)
- Cerebral palsy (CP)
- Myopathies
- Congenital muscular dystrophy

### Features and Benefits

- Five speeds for passive exercising
- Five levels of resistance for active exercising
- Auto reverse enables the reduction of a sudden increase in muscle tone (spasticity)
- Adjustable radius of movement of hand grips or footrests
- Upper or lower limbs training
- Improve blood circulation, muscle tone and range of motion
- Improve strength and endurance
- Activate rhythmical locomotion patterns
- Decrease atrophy, spasms and swelling
- Motor Learning
- Easily interchangeable accessories

### Grow & Tell App

When you use the APT Trainer as part of a physiotherapy program, you will want to share your progress with your healthcare providers. The Grow & Tell App lets you grow in your abilities and to share your progress with others.

Install the app on your smart TV, tablet or smartphone to start tracking and sharing your progress.



# + Active-Passive Trainer for the Elderly Population

Over the past century, advances in medicine and public health have led to a significant growth in the average lifespan.<sup>1</sup> Unfortunately, many health problems are related to aging, including osteoarthritis, dementia, cancer and cardiovascular diseases.<sup>2</sup> Furthermore, aging is also associated with frailty, a condition of increased vulnerability for adverse health outcomes, including disability, loss of independence, falls and mortality.<sup>3</sup> Frail elders experience fatigue, weakness, muscle atrophy, low activity levels and reduced walking speed.<sup>4</sup> It is estimated that in the United States, 15% of the older non-nursing home population is frail, and 45% are prefrail.<sup>5</sup>

According to the World Health Organization, exercise is one of the primary interventions for preventing age and frailty related health disorders.<sup>6,7</sup> Broad exercise interventions are recommended for pre-frail and frail older adults, including resistance, aerobic, balance, and flexibility exercises. Regular aerobic exercise improves health, cognitive abilities, and cardiorespiratory fitness. Additionally, resistance training improves muscular strength, gait speed, decreases the risk of falling and helps to maintain joint range of motion.<sup>8,9</sup>



## For healthcare practitioners

Aerobic exercise recommendation according to a recent umbrella review of systemic reviews: 2-3 days per week for 10-20 minutes per day with moderate to vigorous intensity (Borg CR10 of 6-8 or 80-95% HRmax). The aerobic exercise should be performed as part of a multi-component exercise program of up to 60 minutes for pre-frail older adults (20 mins resistance, 10 mins aerobic, 20 mins balance, 10 mins flexibility) and up to 45 minutes for frail older adults (10 mins resistance, 20 mins aerobic, 8 mins balance, 7 mins flexibility).<sup>9</sup>

The Active-Passive Trainer (APT) enables the performance of repetitive cycling movements of the upper and lower extremities. With the APT, the training program can be customized to suit aerobic conditioning for most older adults. Moreover, The APT can be used for resistance training with five different resistance levels for elders new to strength training. Deconditioned and frail elders may benefit from the APT's Passive Mode (fully motorized), followed by the Passive Assist Mode (motorically assisted) to increase capabilities. The APT can be adjusted to meet the patient's needs, including recumbent, semi-recumbent, sitting and standing positions. If needed, accessories providing additional support for the limbs can be added.

## Aerobic training recommendation\*, perform 3-5 days per week

1. Start with five minutes of low-intensity cycling.
2. Cycle for 20 minutes, at light to moderate intensity (11-14 on the Borg RPE\*\*).
3. Finish with five minutes of low-intensity cycling.

\*Please consult your physician or physical therapist before training.

\*\*[https://www.physio-pedia.com/Borg\\_Rating\\_Of\\_Perceived\\_Exertion](https://www.physio-pedia.com/Borg_Rating_Of_Perceived_Exertion)

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## Clinical Research

Tzora has been building rehabilitation trainers for the past 25 years. We design our devices to improve the lives of users. Multiple clinical studies have been completed on patients using the features offered by APT Trainers.

Below is a sampling of some of the clinical studies that you can read at [www.tzora.com/apt](http://www.tzora.com/apt).

### **Clinical Benefits of using Passive Leg Cycling for People with Spinal Cord Injuries (SCI) – Clinical Studies**

- Impact of Passive Leg Cycling in Persons with Spinal Cord Injury: A Systematic Review
- The Effect of Electrical Passive Cycling on Spasticity in War Veterans with Spinal Cord Injury
- The Effect of Passive Cycling Movements on Spasticity After Spinal Cord Injury: Preliminary Results
- Updated SA Spinal Cord Injury Service SubAcute Model of Care 30 Nov 2016

### **Clinical Benefits of using Passive Leg Cycling for People with Multiple Sclerosis (MS) – Clinical Studies**

- The Effect of Cycling Using Active-Passive Trainers on Spasticity, Cardiovascular Fitness, Function and Quality of Life in People with Moderate to Severe Multiple Sclerosis (MS); a Feasibility Study
- The Effects of Therapy on Spasticity Utilizing a Motorized Exercise-Cycle
- Cycling Progressive Resistance Training for People with Multiple Sclerosis: a Randomized Controlled Study
- Exercise Prescription for Patients with Multiple Sclerosis; Potential Benefits and Practical Recommendations

### **Functional Recovery and Walking Ability of Lower Extremity in Patients with Stroke**

- Effect of Biofeedback Cycling Training on Functional Recovery And Walking Ability of Lower Extremity in Patients with Stroke
- Acute Bouts of Assisted Cycling Therapy for People with Chronic Stroke-Related Deficits
- Effects of Passive Exercise Training in Hemiplegic Stroke Patients. A Mini-Review

### **Fractures Involving Knee Joints**

- Knee Joint Replacement Surgery Post-Operative Exercise Program

### **The Effect of Exercise During Hemodialysis**

- The Effects of Passive and Active Intradialytic Pedaling Exercises on Dialysis Efficacy, Electrolytes, Hemoglobin, Hematocrit, Blood Pressure and Health-Related Quality of Life in Hemodialysis Patients

### **Clinical Benefits of using Leg Cycling for People with Parkinson's Disease (PD) – Clinical Studies**

- Active Assistive Forced Exercise Provides Long-Term Improvement to Gait Velocity and Stride Length in Patients Bilaterally Affected by Parkinson's Disease
- A 12-Week Cycling Training Regimen Improves Gait and Executive Functions Concomitantly in People with Parkinson's Disease
- An 8-Week Low-Intensity Progressive Cycling Training Improves Motor Functions in Patients with Early-Stage Parkinson's Disease

### **Clinical Benefits of using Active Passive Cycling for Children with Cerebral Palsy – Clinical Studies**

- Pediatric Endurance and Limb Strengthening (PEDALS) for Children with Cerebral Palsy using Stationary Cycling: A Randomized Controlled Trial
- Task-Specific and Functional Effects of Speed-Focused Elliptical or Motor-Assisted Cycle Training in Children with Bilateral Cerebral Palsy: Randomized Clinical Trial
- The Pedals Stationary Cycling Intervention and Health-Related Quality of Life In Children with Cerebral Palsy: A Randomized Controlled Trial
- Characteristics of Lower Leg Muscle Activity in Patients with Cerebral Palsy during Cycling on an Ergometer
- Method of Analyzing the Performance of Self-Paced and Engine Induced Cycling In Children with Cerebral Palsy

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