

## ***Dynamic Stair Trainer***

*The first adjustable stair trainer for physiotherapy*

## **A Letter to the Physiotherapist**

**DPE MEDICAL is proud to present the *DST* device.**

The *DST* is a progressive rehabilitation device designed to retrain the gradual use of stair-climbing skills in order to regain mobility and independence.

The device consists of four stairs whose height can be altered electronically. The physiotherapist can set the height between the stairs according to patients' abilities and then gradually increase it depending on their progress. Thus patients can start training as soon as they can stand up and take their first steps. The *DST* improves patients' motivation as they can see the height which is clearly marked on the device. Patients can visually view the progress towards their goal, namely the ability to mount standard stairs.

Our experience shows the both patients and physiotherapists ultimately prefer the *DST* compared to all other devices, instruments and units in the physiotherapy hall. We have witnessed many cases of patients coming to train on the *DST* by themselves after hours. The patients realize the direct consequence between their ability to mount stairs and the prospect of being discharged home swiftly without severe restrictions to their mobility and independence.

The possibility of adjusting the height between the stairs avoids the terrible frustration that patients (and physiotherapists) encounter when they cannot mount standard stairs.

The *DST* is suitable for different kinds of rehabilitation. The railings on both sides are also adjustable according to height. A further advantage is that the *DST* in its horizontal-flat position can be multi-used as parallel bars.

We are convinced that the *DST* will make an immense contribution towards your patients' rehabilitation along with a more effective and efficient use of the physiotherapists' workload and time.

**THE *DST* WILL MARCH YOUR PHYSIOTHERAPY HALL INTO  
THE 21<sup>ST</sup> CENTURY!**

## EVALUATION OF THE *DYNAMIC STAIR TRAINER*

### **General Description**

The DYNAMIC STAIR TRAINER (DST) is an innovative new device designed for the gradual practice of stair-climbing skills for people undergoing physical rehabilitation. The apparatus features four steps whose height can be adjusted electronically from zero to 16.5 centimeters (0-6.5 inches) between steps.

The DST is also equipped with handrails on either side; both the height of the handrails and the distance between them can be adjusted.

The device is designed for people in various stages of rehabilitation who need exercise to regain their ability to use steps following illness, heart problems, stroke, orthopedic injuries, car or work accidents, surgery (including knee replacement), neurological injuries or amputations. In general it is suitable for anyone requiring physiological rehabilitation, including children.

### **Uses**

Step climbing is a basic everyday skill, which is why physiotherapists emphasize practicing on steps: to enable patients to return to their natural environment as quickly as possible with a minimum of restrictions on their mobility.

Step climbing provides many other beneficial side-effects, including general strengthening of the body, improving coordination, enhancing self-confidence and improving balance.

Being able to adjust the height of the steps precisely to suit each patient's level enables patients to begin step exercises during the first stages of rehabilitation, immediately after they are able to walk – and sometimes even before.

To operate the device is simple: press a button and the height of the steps adjusts electronically to just what the patient needs. It is even possible to readjust step height during the exercise session, should this be necessary.

### **Advantages of the DST**

The DST was tested over a period of several months at numerous rehabilitation centers. Here are the findings:

#### **Practicing step climbing at an earlier stage of rehabilitation**

Because the steps could be adjusted so accurately to the patient's level of ability, exercise could begin at an earlier stage of rehabilitation. On regular steps or on a wooden step device, the height of the steps is set, usually at 15.5 centimeters (6.5 inches). A patient who cannot yet climb steps of this height cannot begin stepping exercises. With this device, we could adjust the height to exactly what the patient was able to do and thus begin exercise at an earlier stage.

Some patients began climbing the steps at a height difference of one centimeter and within two days succeeded in climbing steps three centimeters high. Five days later they could already climb eight-centimeter steps.

By introducing this exercise at such an early stage, the entire rate of the patient's progress increased – not only the ability to climb steps, but also the ability to walk.

### **Reciprocal ascension of steps**

In other cases, the DST allowed patients to ascend and descend steps reciprocally. A common phenomenon among people with one weak leg is to climb steps by leading with the strong leg and dragging the weaker one up to it. By adjusting the DST to the functional level of the weaker leg, patients succeeded in climbing steps reciprocally, rather than by dragging the weaker leg to catch up with the stronger one. The exercise contributed greatly to the patient's progress, and eventually we were able to increase the height of the steps while maintaining reciprocal ascent.

### **Increased patient motivation**

An interesting and important aspect of the use of DST was the dramatic increase in the patients' motivation to perform the exercise. We know that exercising on steps can be fraught with frustration, pain and anxiety. Adjusting the height of the steps precisely to the current ability of the patient affords a feeling of achievement as well as reassurance that they will be able to perform this important exercise after their release from the hospital. As one patient said: "Now I'll be able to climb the stairs at home." This increased motivation was visible in the patients' willingness and desire to exercise.

Patients would go up and down the steps several times, with the physiotherapists increasing the height of the steps from time to time. They could actually see their own improvement as they found themselves able to ascend steps at a height that only days before had been too high for them.

### **Adjustable handrail height and width**

The possibility of adjusting the height of and the distance between the handrails afforded the staff much greater flexibility in practice. With the height of the rail adjusted to suit the patient's height and condition, the patient could concentrate more firmly on his main task. Adjusting the distance between the rails enabled patients who required it to ascent with handrail support on both sides. Other patients, in contrast, needed greater distance between the rails so that they could hold onto the handrail with one hand and an auxiliary aid, such as a cane or walker, with the other.

### **Independent practice**

The adjustability of the steps and the handrails as well as the general safety of the device allowed some patients to practice independently after receiving appropriate guidelines from the physiotherapist. Independent practice also accelerated the rehabilitation processes and enhanced the patients' self-confidence.

### **Shortening rehabilitation time**

In essence, all the points mentioned above contributed to reducing the time required to acquire step-climbing skills and thus of the entire rehabilitation process. The saving in time required to learn to cope with steps was at times quite dramatic

### **Adoption of the DST by the staff**

It usually takes quite some time for a medical staff to adopt a new device or apparatus. With the DST, the medical staff was exceptionally enthusiastic and responses such as “Where has this device been until now?” and “How did we get along without it until now?” were common.

### **Savings and efficiency**

The DST saved us treatment time and made our work more efficient. Instead of improvising all kind of platforms with steps of different heights to meet the patient’s needs, the physiotherapist simply pressed the button and immediately had a device that was perfectly adjusted. The fact that step-height could be adjusted to the patient’s ability to practice by himself also helped. For example, this freed the physiotherapist to work with someone else while giving instructions and taking an occasional look at the patient working by himself on the DST.

### **Summary**

It is rare that a physiotherapist receives an auxiliary aid so essential for performing the sacred work of enabling patients to return to their daily routine. This is what happened in the case of the DST.

The DST creates a veritable evolution in the physiotherapy hall and as it is used for the first times, immediately becomes an essential tool of rehabilitation. Beyond its proven effectiveness, the DST is popular with both staff and patients.

The DST offers another benefit: It can accurately monitor the rate of the patient’s progress (A graph with dates of the exercise on the X axis and the height of the steps on the Y axis dramatically presents the patient’s progress during his rehabilitation). This gives the physiotherapist both a tool for working with patients and a tool for monitoring their progress. The graphic display can be presented at staff meetings and used when communicating with outside agencies (medical institutions, insurance companies, etc.).

The DST is a device that accurately meets a real and basic need in rehabilitation. This is its greatest value.

## **DST for Older People**

It's a known fact that the older we get, the more important it is to function independently and be mobile.

The quality of life is based on such mundane activities as going to the theatre, taking a stroll in the park, or going to the lobby for a visit with family and friends. Such activities require that the elderly person be independently mobile, and a crucial part of that is the ability to confront stairs, which are everywhere.

The elderly person's fitness and ability to negotiate stairs successfully affects almost every aspect of his everyday life and activities. In extreme cases, an elderly person might not be able to cross the road safely because of the difficulty of mounting a pavement.

The *DST*'s main objective is to train people to use stairs. Elderly people can start training gradually according to their physical abilities. Later on they can increase the height between the steps until they reach the standard height. Occasionally elderly people suffer a trauma of some kind as the result of a fall, a weakness due to illness, etc.... They lose confidence and find themselves in a vicious circle: insecurity leads to avoiding stairs, avoiding stairs reduces their fitness and quality of life, and so on. The *DST* helps people emerge from that vicious circle. It is a user-friendly device: elderly people can set the desired height according to their comfort and eventually attain the physical fitness and confidence required for standard stairs.

The world's population is getting older. The need to train stair-climbing skills increases as we get older. Therefore the *DST* is a necessary feature of the everyday life of elderly people, in order to preserve their well-being.

Ezrath Nashim Association  
**SARAH HERZOG MEMORIAL HOSPITAL**

---

Mr. Daniel Orgal  
DPE Medical, Ltd.  
POB 49  
SHOEVA

Dear Daniel,

Re: *User Report on the DST*

It is my pleasure to respond to your request for our opinion as users of the *DST – Dynamic Stair Trainer*.

The apparatus has been in daily use at the Herzog Hospital Institute of Physiotherapy for the past eighteen month and it is hard for use today to understand how we ever managed without it.

The ability to adjust the steps and change their height enables step practice for patients whose range of movement and muscle strength are not yet sufficient to manage the regular step height (17cm). It is possible to make progress with each patient on a individual basis, according to his ability.

The ability to rescue a patient easily in the event he gets “stuck” on the top step means we can bring him down quickly and in safety.

The adjustable handrails enable maximum tailoring to the needs of each patient. The additional handrails installed in May do indeed make it possible to use the steps in part as in inclined walking surface, simulating everyday functioning outside the house.

All adjustments are user-friendly, for both patient and therapist (and it is known that if adjustment is too complicated the therapists manage without).

My colleagues, as well as the patients, like the “high-tech” appearance of the steps, which project an active and dynamic image, with an excellent finish that is uncompromising with regard to the safety of the user.

The apparatus has broken a record in our department: eighteen months of intensive use and not a single problem!

*DPE Ltd.* service is impressive in its reliability and offers me a ray of hope that it is possible to obtain service at high standards in terms of precision, meeting timetables, etc. Last but not least, this is a sophisticated device that we enjoy very much!

Keep up the good work,

**Nava and the physiotherapy staff,**  
Herzog Hospital



# Progress Chart

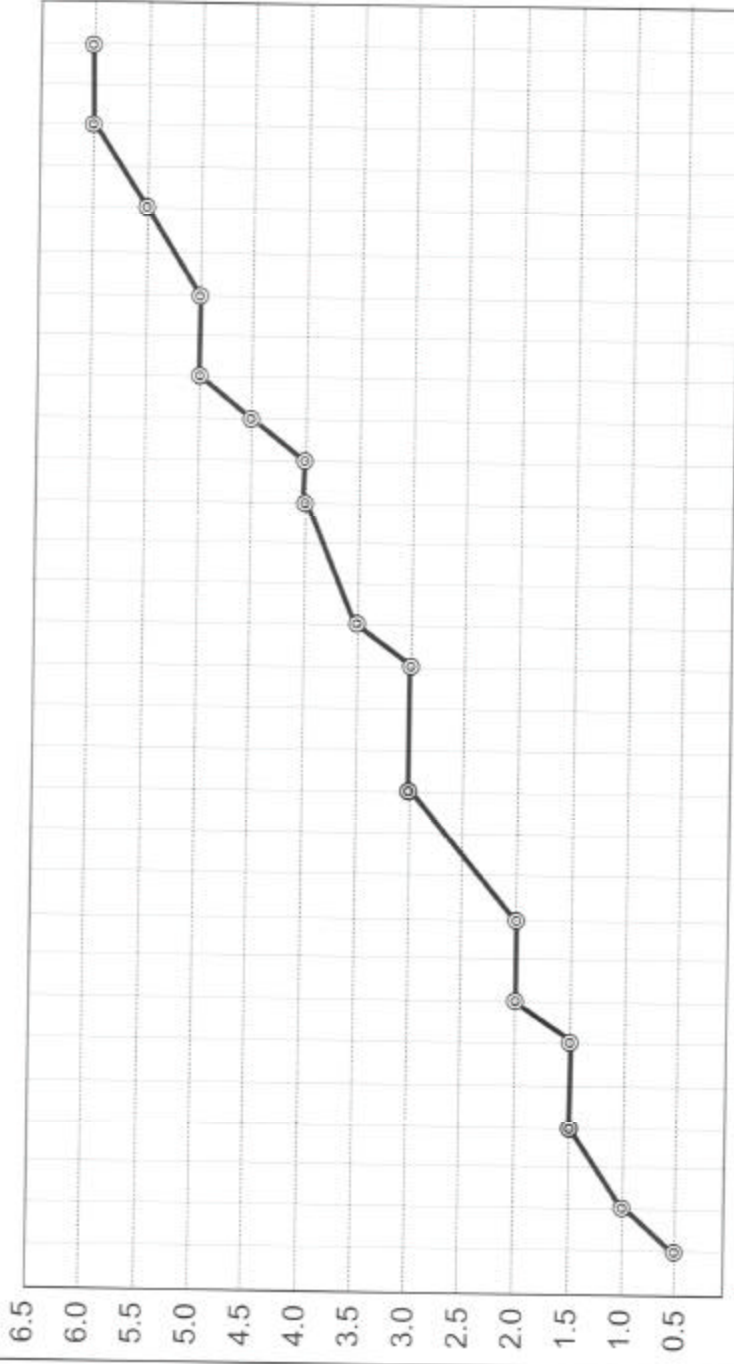
Name: Ben Arthur

Id. : 2444768438

Inst. & Physio. \_\_\_\_\_

Inches

**S T A I R                      H E I G H T**



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

Date

Remarks: \_\_\_\_\_

Month: November 2002