

F. Tracking the use of APT. Active / Passive Exercise machine

Sample group of army disabled

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Introduction

The **APT. Active / Passive Exercise Machine** is intended to activate the hands and feet. APT. is made so that it can be used in an active manner (that is, the user trains his muscles against a defined force, like the operation of fitness machines), or in a passive manner (that is, the electronic system of the machine activates the user's hands and feet in a manner whose speed and range of motion are controlled). In addition, the machine may be operated in a combined manner – active/passive – in which the user uses the electronic system while activating his muscles. The APT may be used while either sitting or lying down.

The active/passive exercise machine was given to a group of 10 severely handicapped army disabled, who have functional problems in their hands and feet, resulting from damage to one of the vertebrae in the spine, or from injury to the head.

Table 1 gives the details of the sample group. The machine was given to each disabled person, after having received detailed instructions regarding its use. The machine was given for a period of three months. It was decided that during this time, the use of each group member of the machine would be tracked. The tracking was conducted via periodic telephone conversations, and listening to the subjective opinion of each user. In the telephone interviews, each user was asked to supply information regarding several topics:

- Duration of use in each exercise session
- Frequency of use
- Methods of use – active, passive or combined
- Levels of difficulty chosen by the user
- Physiological changes if there are any
- Critical comments
- General opinion

The aims of the tracking were:

- To locate mechanical problems and provide immediate answers to them
- To teach various means of using the machine
- To identify special needs
- To consolidate recommendations for continued development

The Sample Group

The sample group included 10 disabled with a high level of disability, who were selected randomly by the rehabilitation division of the ministry of defense. Below are the group's details:

Table 1: The Sample Group

User's code	Yr. of birth	Injury type	Injury year	Date Machine Received	Comments
1	1953	Head	1973	8.2.94	Partial paralysis
2	1961	Back, C6	1984	31.1.94	Partial paralysis, spasm
3	1953	Head	1980	31.1.94	Partial paralysis
4	1933	Back, C6	1954	1.2.94	Partial paralysis, spasm
5	1952	Back, D2-3	1972	31.1.94	Spasm
6	1973	Back, C5	1992	26.1.94	Partial paralysis, strong spasm
7	1960	Back, C5-6	1980	31.1.94	Spasm
8	1940	Back, L2	1960	26.1.94	Partial paralysis
9	1938	Back, L1	1962	11.2.94	Partial paralysis
10	1969	Back, C6-7	1991	15.2.94	Weak spasm

Characteristics of use

Table 2 shows the usage characteristics of each of the participants in the sample group. The table presents the user's code, the time of usage in each session, the frequency of use, separately for hands and feet. The meaning of the term "active" is that the user operates the machine using only his muscles. The meaning of the term "passive" is that the motor of the machine moves the user's hands or feet. The meaning of the term "combined" is that the user operates the machine using both the strength of his muscles and the motor of the machine.

User's code	Hands			Feet		
	Time	Frequency	Character	Time	Frequency	Character
1				15-20 mins	Everyday	Passive level 5
2	25 mins	2-3 times a week	Active level 2			
3				5 mins	Twice a week	Active and passive level 1-5
4	10 mins	Twice a day	Active level 4	30 mins	Twice a day	Passive levels 2-4
5	10 mins	Almost every day	Active level 4	10 mins	Almost everyday	Passive level 4
6	15-30 mins	Everyday	Active level 1-2	30 mins	1-2 times a week	Passive level 5
7	20 mins	1-2 times a day	Active level 3-5	20 mins	1-2 times a day	Passive level 5
8	10-15 mins	1-3 times a week	Active level 5	10-15 mins	1-2 times a week	Combined level 5
9				10-20 mins	3 times a week	Combined level 5
10	20 mins	Everyday	Active level combined level 3			

Subjective evaluation

In this section, we will present some of the user's comments, as expressed by them during the telephone interview. The comments include the subjective opinion by the sample group members of the operation of the exercise machine, as well as suggestions for improvement. It must be noted that each of the group members expressed much satisfaction with the machine and its operation, and all them would like to have the machine remain at their disposal. The name of each speaker is not noted in this report, but exists on the interview sheets.

Positive comments:

"The machine is excellent".

"It relaxes the legs in a fantastic way"

"Overall greatly enjoying the product. The previous machine was primitive and this is at another level".

"Very comfortable to use".

"Very good for the blood flow to the legs".

"Simply wonderful".

"During a spasm, the machine stops working and changes direction and that relaxes the spasm".

"Satisfied with the machine".

"The frequency of use went up with time, from three times a week to everyday, and from 5 minutes of use to 10 minutes each time".

"Relaxes the shoulders well"

"The spasm relaxes after use"
"Feel better in the whole body"
"Great for the hands"
"The machine is light and can be moved from place to place"

Critical comments:

"Its good that the machine is light and portable, but it is not sufficiently attached to the ground"
"I want a head switch"
"Use it for the hands only because of inconvenience in lifting and lowering the machine"
"Even though the machine is relatively light, it is heavy for a woman. Would very much like a mechanism that would allow raising and lowering the machine for use with hands and feet"
"During use on the bed, the machine slides"
"The straps don't connect the machine well enough to the cart, and it slides".