

The Role of Physical Therapy in Prosthetics



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Much is written and said about team approach and team concept. Much of this, too, is lip service to the concept, with no actual participation in the goals set and desired. However, we find the true structure of the team approach is a necessity in the total treatment of the individual with an amputation of one or more extremities. This may be due to the fact that a group outside the medical profession is a vital and absolutely essential member of this team, and that each team member is wholly dependent on the skills and knowledge of the other members in order to complete the total job successfully.

The role of the therapist is of importance through the entire period of rehabilitating the amputee. The phases of therapy during this period with all amputees, whether upper or lower extremity, can be divided into:

1. Evaluation
2. Pre-prosthetic therapy
3. Training or post-prosthetic therapy

The evaluation of the amputee consists of determining range of motion, muscular strength, coordination, and balance, and whether these are adequate.

The pre-prosthetic therapy period may be short or long, depending on the needs of the amputee. The therapist may aid the surgeon and the hospital staff by explaining and demonstrating to the amputee the replacements available, teaching crutch gaits, emphasizing good posture, by teaching proper bed positioning to prevent contractures, by teaching graduated exercises to prevent contractures and loss of strength, and by instructions in properly applied bandages to shape and shrink the stump. A maintenance program for uninvolved extremities may be carried out at home. The amputee may be given instructions in exercises and bandaging for a home program or kept on a supervised clinic basis.

In the post-prosthetic period the therapist is responsible for the check out of the prosthesis and the training in its use. The time involved is determined by many factors, such as type of amputation, level of amputation, multiplicity of amputations, age of the amputee, motivation of the amputee, plus economic and social factors.

In training the amputee, we find that some patients can carry out a satisfactory home program of exercises and bandaging, if properly taught,

between the acute hospital period following surgery and the fitting of the prosthesis; while others will require a more intensive supervised program on a daily or three times weekly schedule. Bandaging must be continued until the amputee is able to wear a prosthesis every day, all day, and can apply the prosthesis without difficulty.

With the lower extremity amputee the ability to balance is of the utmost importance and must be acquired by the amputee, before he can learn to walk satisfactorily. Therefore, we start the amputee in a set of parallel bars, which is a safe and secure environment to learn balance and to regain confidence. We feel the parallel bars should be a minimum of sixteen feet long, so as to allow good heel-toe gait without constantly turning around.

We discourage the use of walkers, except in extreme cases, because we feel an amputee never gains good balance in a walker. It also is extremely difficult to wean the user away from the walker. We discourage the use of crutches during prosthetic training for the same reasons. We resort to crutches with a prosthesis only after all other attempts at safe ambulation have failed.

Training progresses from balance in the parallel bars to ambulation with both hands on the rails, to one hand on the rail, to one cane in hand opposite the prosthesis, to walking outside the bars with therapist as standby support, to independent walking and Activities of Daily Living.

By Activities of Daily Living is meant sitting and getting up from chair, going up and down stairs, up and down curbs, stepping over obstacles, kneeling, falling with safety and getting up, going up and down inclines, walking on rough surfaces, getting in and out of car, and taking public transportation.

The upper-extremity amputee may have more emotional problems, and may need more support from the therapist than the lower-extremity amputee. The length of the training period will vary with the individual patients for

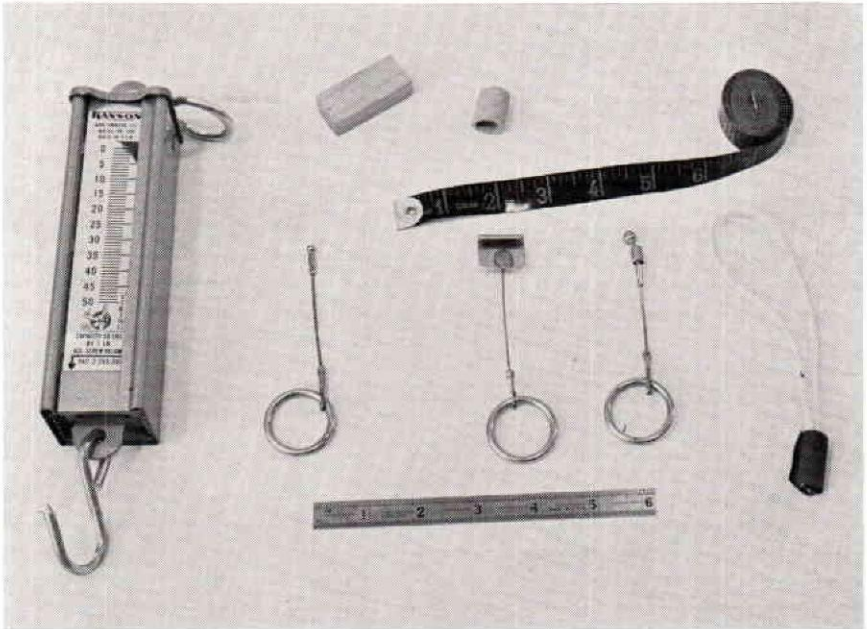


FIGURE 1

the same reasons as with the lower-extremity amputee. As a rule, however, the training period is shorter because fit of the upper-extremity amputee is purely suspensory; while the lower is weight bearing.

In training the upper extremity amputee, the therapist must have a few training aids. First of all, to do a check out requires the use of a scale, adapters, rule, tape measure, goniometer. (Fig. 1) Then, following teaching the controls necessary to open and close terminal device, lock and unlock elbow, position hook, the amputee should be taught approach, grasp, and release of objects. In order to do this effectively, we use a form board, (Fig. 2) which is composed of some twenty objects of different shapes, sizes and material. Some are square; others are triangular, or round. They are of various heights as well as circumference. Some of the objects are soft rubber, and thus spongy and very light weight; others are metal, and thus slick and heavier. The board has definite pockets into which these objects fit, and the amputee practices picking up each object from the table and placing the object in its exact spot on the board. In this way, the amputee uses the motions he has been taught to reach out and grasp an object and release it, under a controlled situation.

This is the only training given as a one-handed situation. All other training is carried out with two-handed activities requiring the use of the prosthesis as a helping device for the remaining good hand.

There are many aids or gadgets that are helpful in training the upper-extremity amputee, which he frequently will continue to use in his Activities of Daily Living. Figure 3 shows a type of hand brush which most upper extremity amputees find useful because the hollow handle allows a firm grasp of the brush with the hook. Figure 4 shows a long finger nail file, so held that it can be anchored in the hook and used effectively by the

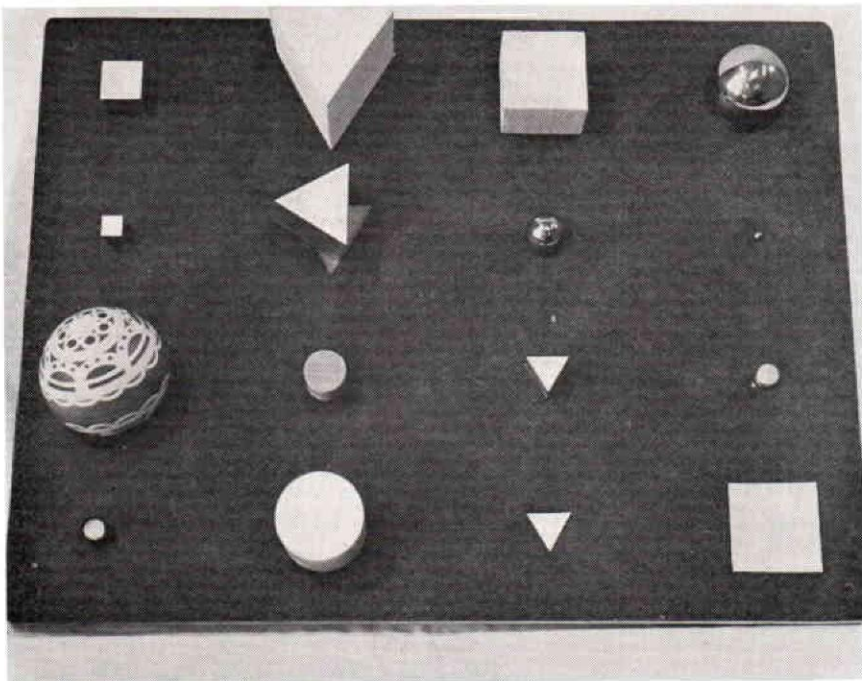


FIGURE 2



FIGURE 3

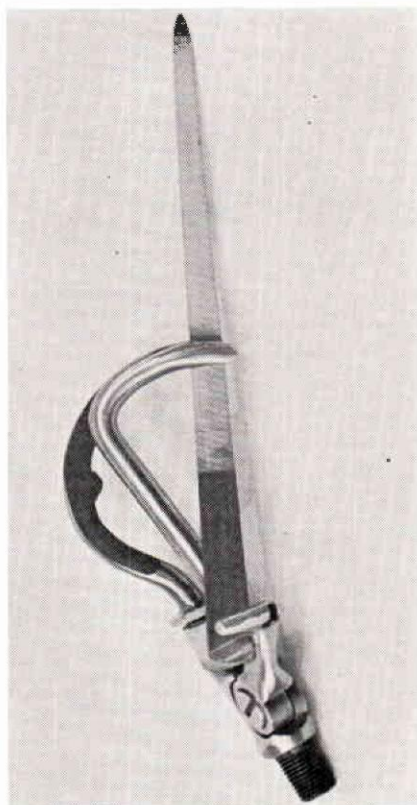


FIGURE 4

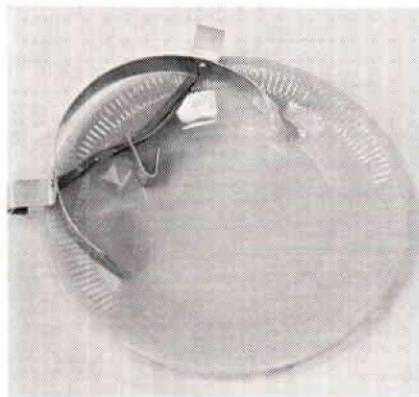


FIGURE 5

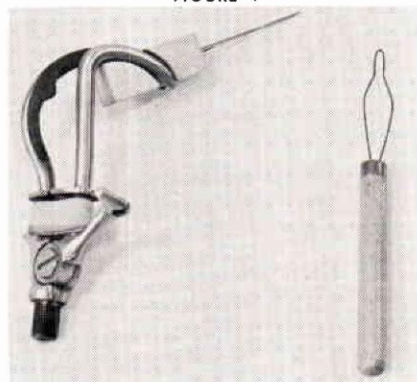


FIGURE 6

amputee. Figure 5 shows a plate guard which is particularly helpful to the upper extremity bilateral in keeping food on the plate while he is eating. Figure 6 shows two types of button hooks which unilateral amputees find helpful in buttoning the shirt sleeve, and the bilateral uses also to button the shirt front.

Many of these gadgets are available commercially, and frequently the amputee himself will suggest equipment which he finds meets his needs.

One of our bilateral amputees figured out a recoiling chain fastened to his feet so that it was easily accessible for his use.

There is no other phase of physical therapy where the therapist has more chance to use her initiative, ingenuity, judgment and personality than with the upper-extremity amputee. The challenge is tremendous and the rewards gratifying, because the amputee responds so gallantly to interest shown, and between the efforts of the two a solution is always found.

I feel quite strongly that the physical therapist expected to work with amputees must have a knowledgeable background, not only in anatomy, kinesiology, and the sciences taught in our physical therapy schools, but also in prosthetics, particularly component parts, gait determinants, socket types, research being done, etc. Our physical therapy schools are incorporating more on prosthetics into their courses, which is one solution. In the meantime, the therapist expected to participate in a prosthetic program should be given the advantage of attending the prosthetic courses offered by Northwestern University, New York University, or University of California, Los Angeles.

New Facilities Certified

By action of the Committee on Facilities of the American Board for Certification, the following Facilities have either been granted Certification, or have been re-instated in good standing, since the publication of the 1962 *Registry of Certified Prosthetic and Orthopedic Appliance Facilities*.

CALIFORNIA

San Bernardino:

LANHAM LIMB AND BRACE COMPANY

1545 North Mount Vernon Avenue

Harvey G. Lanham, C.P.O.

P&O
830-506

MASSACHUSETTS

Boston:

THE REHABILITATION CENTER

LIBERTY MUTUAL INSURANCE COMPANY

372 Stuart Street

Joseph C. Aveni, C.P.

P
Liberty 2-4850

NEW YORK

Syracuse:

FREES AND TYO, INC.

1124 East Fayette Street

P
GRanite 6-9708

OHIO

Cincinnati:

CENTRAL ORTHOPEDIC APPLIANCE COMPANY

2815 May Street

John F. Skahan, Owner

O
CApitol 1-6060

PENNSYLVANIA

Harrisburg:

KEYSTONE ARTIFICIAL LIMB & ORTHOPEDIC CO.

224 Chestnut Street

J. H. Shapiro, Owner

P&O
CEdar 4-3888

TEXAS

San Antonio:

LONE STAR ARTIFICIAL LIMB COMPANY

1311 South St. Mary's

Robert M. Williams, C.P.

P
LEhigh 4-6390