

SHOULD PERIODIC REASSESSMENT BE CONSIDERED FOR THE CHRONICALLY DISABLED

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Handicapped persons, though each has his own individuality, may be roughly grouped into the following categories, mostly according to achievement and work tolerance and the degree of limitation, physical or mental:

1. Those whose recovery permits them to return to their previous employment.
2. Those requiring re-training to fit their residual disability to a new job.
3. Those whose handicap prevents them from competing in the open labour market, and who require some type of sheltered employment.
4. The severely disabled, who are known as 'the home-bound'. This group can be subdivided into:
 - (a) Those who are immobile but have the use or a degree of use of their hands and, provided some suitable work is brought to them in the home, have a fair chance of making a small contribution to the family budget.
 - (b) The 'write-offs'—those whose handicap prevents them from any participation in daily living, who are utterly and completely dependent on others for their every need.

It is surely this last group which presents the most baffling problem to the medical rehabilitation team. There has been a steady development of these teams throughout South Africa. The problems set before their members are many and varied. To some of them there is no answer, others are challenging, and not a few have brought encouragement and reward to the team. It has been said that 'a crippled individual can be led to look at the stars, but he must be led'.

The purpose of this article is to review a case who fell into the last of these categories, and who after careful and repeated reassessment has been *led out*.

CASE RECORD

Mrs. S.B., aged 41 years

Before World War II Mrs. B., then unmarried, had lived in a country district, not following any particular type of occupation until during the war she served in the Forces as a heavy transport driver. Towards the end of the War she married, had one stillborn child, and was later divorced because of her subsequent disability.

Some short time after the birth of the child, in 1944, she contracted poliomyelitis at the age of 27 years. The history was as follows:

On the 1st day the symptoms were associated with head-

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ache and running nose (she thought she was developing influenza) and on the 2nd day she complained of low back-ache.

Early on the 3rd day the right arm was paralysed. Later in the day further paralysis ensued in the following order: legs, left arm, neck, stuttering speech. No respiratory embarrassment.

The backache lasted and was constant and severe for about 3 weeks after onset of illness; pain of a burning nature in her arms ensued, but was even more severe in her legs, which were acutely painful to touch.

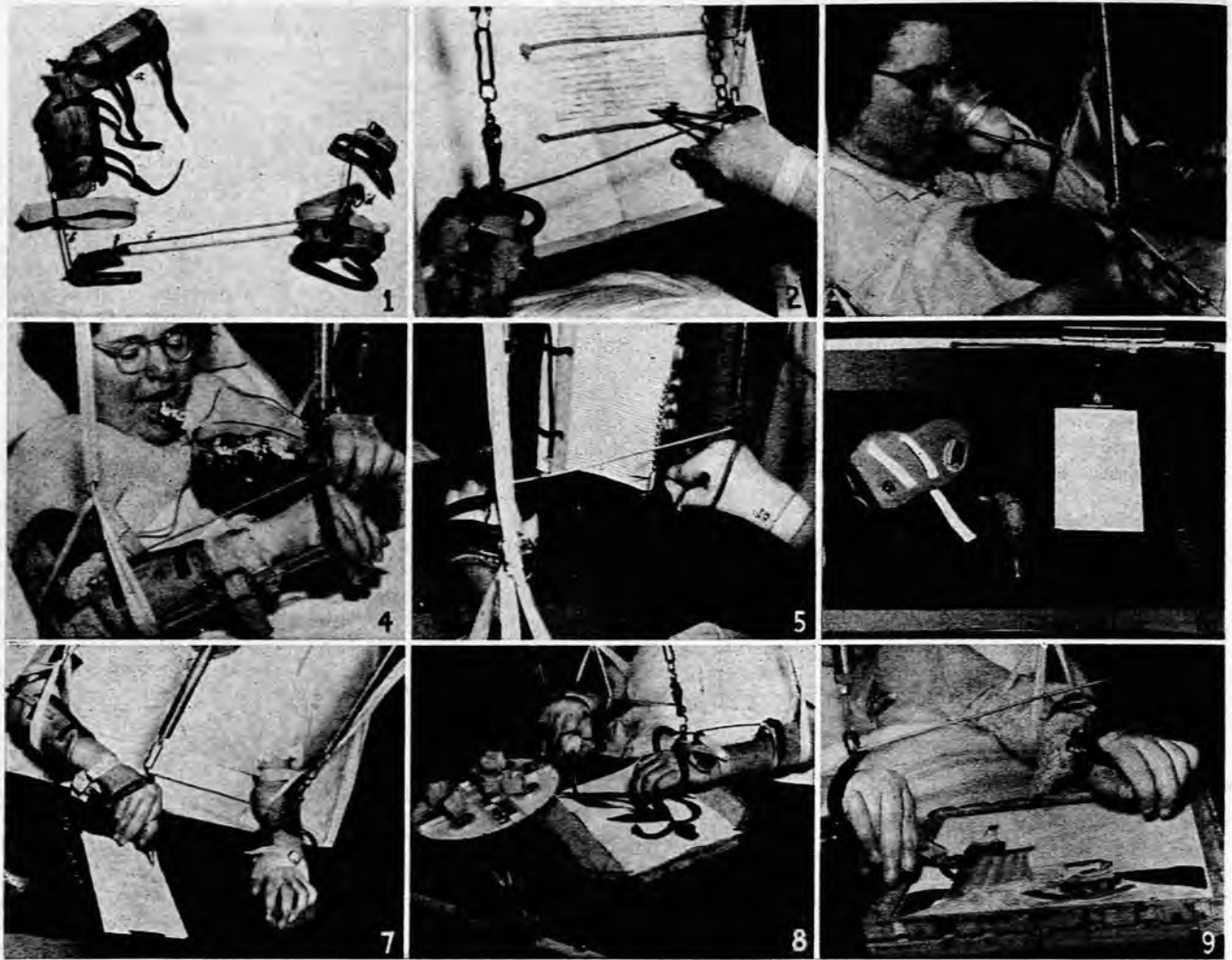
Five weeks from the onset all pain had disappeared. Hospitalization, during which time patient received physiotherapy and occupational therapy, was continued for 21 months in a Transvaal hospital. Apart from being able to sit when put in a chair, she was, on discharge, a completely helpless invalid, quite unable to move any limb or alter her position in bed by half an inch.

She was discharged to her home, which was in a small fishing village on the Cape coast. There she lay in bed for 7 years, looked after by her parents or a Coloured servant girl. No plan had been made for her to be reassessed medically. Her only source of income was a small Army pension. A transitory opportunity had once come her way to coach a few backward children from the local school, who were brought to her in her room. She was otherwise confined to reading as her only occupation. She had to have her book on a stand and so near to her that she could turn the pages with her tongue.

It was in this state in 1953 that the case was brought to the notice of the Cape Cripple Care Association, who negotiated her admission to Grootte Schuur Hospital, Cape Town, where she was afforded the following periods of in-patient treatment: 23 August to 24 October 1953; 1 September to 7 November 1956; 29 June to 20 July 1957; 13 April to 8 June 1958.

Physicians and orthopaedic surgeons investigated her physical condition. Disuse atrophy in the non-affected muscle groups was present, and joint movements in all limbs were limited. Neither physician nor surgeon felt that anything could be done by them for the patient, and she was referred to the Department of Occupational Therapy, mostly with a view to fitting her with some automatic page-turning device.

The patient had made good adjustment to her handicap. She had faced the reality of her physical limitations, and her indomitable spirit had in no way suffered defeat. It was this spirit displayed by the patient which brought a challenge to the occupational therapist. Should the patient be dis-



charged from hospital once more with only a page-turning device? What of her future? What of her disuse atrophy? How could she be activated?

The patient's muscle evaluation chart read as follows:

Left Upper Limb. Trapezius—upper fibres work strongly, middle and lower fibres weakly. Pectoralis group strongly. Flexor carpi ulnaris weakly. Marked wasting, especially of palmar eminences. All other muscles in hand and limb—zero.

Right Upper Limb. Trapezius—upper fibres working, middle and lower fibres zero. All other arm muscles zero.

Right Hand. *Main en griffe* present. Opponens pollicis works strongly. Flexors of hand working, giving static flexion of fingers at metacarpo-phalangeal joints.

Lower Limbs. All muscles zero.

Trunk Muscles. These could not be tested accurately owing to hypersensitivity of the skin, but the patient was unable to sit up or move her trunk to change her position in bed.

Joints. Limited movement in elbow joints. Knee joints fixed in straight-leg position. Hip—only a few degrees of flexion possible, no abduction.

As this patient had by that time spent 7 years in bed,

with reading as her only activity, the occupational therapist felt that an automatic aid to page-turning was of secondary consideration, but that some means should be sought to activate her atrophied muscles. To choose an activity within the range of her capabilities, however, was well nigh impossible, and it was obvious that she would require the aid of some kind of self-help apparatus. The remainder of this article will tell the story of how this was achieved.

First Attempts

The first and very important step in the programme was to eliminate gravity from the patient's arms by suspension in slings and springs, thus giving buoyancy and removing resistance to movement.

A Guthrie-Smith frame was made out of $\frac{3}{4}$ inch galvanized water piping, and erected over her bed (the patient was able to purchase this and have it erected for use at home). A track of roller-type curtain-rail was fitted to the frame above the patient's head, and from this her slings and springs were suspended.

To make possible a more useful position, the flail right arm was fitted with an adjustable elbow brace (Fig. 1a). The right hand was badly deviated in the ulnar position;

this was partly overcome by an extension piece fitted to the brace (Fig. 1b).

The patient's normal lying position in bed was flat on her back, with two pillows. The bed was not adjustable and she had no back rest; so all activities had to be adapted to the patient's position.

Writing was the first activity to be considered and suitable apparatus was designed to meet requirements.

Penholder. As the ulnar deviation prevented the patient from viewing the point of a pencil and, in the absence of controlled grip, prevented her from holding a pencil, a gadget was made that would hold the pencil at a suitably directed angle for her. A compass arm attached to two rings, through which her thumb and index finger were placed, was a satisfactory solution.

Writing Table. This had a perpendicular writing position, and was placed in front of the patient while she maintained her recumbent position in bed. Notepaper was secured by two bands of elastic and held at the top by a bull-nose clip, which in its turn was tied to a length of nylon fishing gut. On the distal end of the gut a chain made up of small key rings was fastened, and this, passing along a pulley system, adjusted the page to its desired height as the patient engaged her pencil point in any one of the rings (Fig. 2).

A new difficulty was encountered at this stage. The patient was unable to move her hand across the paper in the horizontal plane; from a given spot in mid-position she was able to move $\frac{1}{2}$ inch to the right, 2 inches to her left, $\frac{1}{2}$ inch upwards and 1 inch downwards. It became obvious that if any degree of success was to be achieved, the patient's right hand would have to be linked to some driving force, some mechanical device perchance; but this might be clumsy and costly. The occupational therapist foresaw the possibilities of 'harnessing' the power of the patient's left shoulder muscles for this, and it was made possible simply by linking one hand to the other with a connecting rod made from a long aluminium knitting needle (Fig. 1c). The reciprocal movements of trapezius and pectoralis groups provided the necessary drive required to move the arms 4 inches across her notepaper. Great precision had to be observed in the placement of all apparatus in relation to the patient.

It was on this perpendicular surface (Fig. 2) that the patient re-learned her writing skill; she had great powers of perseverance, and within a very short time was writing with clear legibility and with quite a style—her output amounted to 100 letters per month at one stage. Thus, with this added interest, she widened her horizons and strengthened her muscle groups.

Muscle Re-education

Three years passed before she returned to Groote Schuur Hospital for further reassessment. The muscle tests and other investigations recorded definite improvement, and the orthopaedic surgeon suggested stepping up her occupational therapy activities. A very definite limiting factor was her position in bed but, through the timely cooperation of the Cape Cripple Care Association, an adjustable surgical bed was provided, plus other aids to more prolonged comfortable sitting. Another hindrance to sitting with more than 40° hip flexion was the tendency to nipping of the anterior capsule of her hip joint, which caused a good deal of pain.

Self-feeding, drinking, embroidery, and painting were

amongst the activities which the occupational therapist introduced in the muscle re-education programme. The methods used were as follows:

Drinking—A non-spill drinking beaker was suspended in a swivel stand, which when placed on the patient's chest could be tilted easily as she initiated the movement with her chin (Fig. 3).

Feeding—This was more complicated, and could not be carried out with her hands harnessed together. The left shoulder had to take the initiative. A plate of nursery type, which provided bunker sides, was placed on an elevated stand resting on her sternum and bringing the plate up to mouth level. The spoon had to be flat, and one end and one side of the spoon was provided with a bunker. The handle was long and flexible and a square end fitted into a socket on the back of the working splint of the left hand. Food was taken onto the spoon with a contraction of the left pectoral, and brought to the mouth with a contraction of the upper fibres of the trapezius (Fig. 4).

Embroidery—To give variety, embroidery was considered. A special tension frame to hold the material taught was a necessity. A very large needle had to be used and passive extension of the thumb was required in order that the patient could get hold of the needle. A light spring was attached to the thumb so that the thumb could be adducted against the spring. The needle was thrust into the canvas and out again all in one movement (Fig. 5).

Writing. As the patient's ability to sit, and her sitting position improved, a change was made in her writing apparatus. The perpendicular writing table was replaced by one standing in the normal bed-table position. The compass gadget for holding her pencil was replaced by a more suitably developed penholder. Using an old tracheotomy tube as the base for the holder, a ball-point refill was pushed through the tube, the curve of which was just that required to meet the need. It was then padded up on the outside to fill the patient's grip. This has become an indispensable part of her equipment. To give an easy flowing rhythmical movement for writing, a glider splint was made for her left hand (Fig. 6), using the anchoring rod to attach it as before to the right hand. This not only added stability but prevented a great deal of fatigue to the patient (Fig. 7). She now conducts much of her business by letter, and writes at a speed of 25 words per minute. In doing this she is independent, except for changing to a new page, and placing the letter within an envelope.

Painting. During a reassessment period in hospital, in November 1956, the occupational therapist suggested to the patient that she might be taught to draw and paint. To this the patient replied, 'I have never painted in my life, and I don't know the first thing about drawing', but with her usual willingness a start was made. A paint brush replaced the pen in the tracheotomy tube, a revolving drawing board was made to increase her working area from 4 inches square to 10 inches square, and last of all a revolving paint box to give easy access to any particular colour (Fig. 8). So began an activity which completely absorbs the patient's interest, for she has discovered a latent talent (Fig. 9). She has learnt much of technique, and the vagaries of water-colour sketching and rendering, but, most important of all she has now got a flicker of movement back in her left triceps. This is attributed directly to the constant use of a knife for scraping out the highlights in her pictures. There

has been a notable toning up of other muscle groups and her work tolerance has increased by many hours.

The subject matter for painting is limited to what can be brought to the patient. She has been particularly successful in painting South African flowers. She has been encouraged to compete in local art competitions, and within 18 months of starting this activity has won a first and second prize. Some of her pictures have been exhibited only recently at the second World Congress of Occupational Therapists in Copenhagen, where a film of her case, 'Hands in Harness', was also shown.

Without the close cooperation of other members of the rehabilitation team the success achieved in the rehabilitation

of this woman would not have been possible. The patient herself was the greatest inspiration, for she would always say of a new gadget, 'It *must* work, it's *got* to work'.

This case forcibly illustrates the importance of periodic reassessment in rehabilitation programmes. For the future, periodic reassessment of the chronically disabled must be insisted on.

In conclusion, how appropriate are the words of Florence Jones Terry: 'As long as medicine is able to prevent so many people from dying, it is up to all those connected with health activities to work out some way by which the rehabilitated individual may lead a useful and satisfactory life.'