

SPINAL CORD INJURY — HOPE THROUGH REHABILITATION AND RESEARCH

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SUMMARY

The incidence of spinal cord injuries in industrial countries is increasing. Rehabilitation and vocational (re)training of these persons in wheelchairs is essential. This article describes a specific rehabilitation programme from the acute phase to the final goal, namely vocational integration. All members of the rehabilitation team are involved.

INTRODUCTION

Few illnesses are more devastating — physically and mentally — than spinal cord injuries. Damage to this vital area can result in paralysis of any or all extremities (The Harmarville Story, 1979).

Until World War II, few paraplegics survived long after the onset of their paralysis. The initial shock was a major cause of death; if the patient survived the shock of his trauma, urinary complications and other medical problems made a return to good health almost impossible (Gregory, 1978). Saltman (1960) says that "because of their high susceptibility to disease, especially in the kidneys and bladder, of the 400 Americans with spinal paralysis carried off the battlefields of World War I, 90 percent were dead within a year of receiving their wounds."

Since World War II, the prognosis with regard to survival of those paralysed by injury to, or disease of, the spinal cord, has improved to an amazing degree. The pioneer work of Sir Ludwig Guttmann at Stoke Mandeville and later of workers at Lodge Moor, Sheffield, and other well established centres has demonstrated that in a great majority of such patients, varying degrees of recovery and good resettlement can and should be achieved (Thompson and Murray, 1967).

Mortality, both early (within three months of injury) and late, has decreased significantly over the last 30 years. This is due to the establishment of the specialised spinal injuries centres, which have opened in most parts of the world since Sir Ludwig Guttmann pioneered the famous Stoke Mandeville Unit in Aylesbury, Buckinghamshire, England, 30 years ago.

Early mortality (up to 80% in 1944) has been reduced to between 5-15% depending on the level and severity of the cord lesion, the presence or absence of severe associated injuries, age, pre-accident health and the expertise of early and continued management (Meyer and Malick, 1978).

CAUSES

- 80% - 90% due to spinal cord injuries.
- 10% - 20% due to tumours, infections, multiple sclerosis, congenital defects, etc.
- 30% - 50% of spinal cord injuries due to transport accidents.
- Remainder due to domestic and industrial accidents, sports, falls and penetrating wounds.
- Greatest single cause is car accidents.

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Received 28 July 1980.

OPSOMMING

Die probleem van paraplegie en kwadriplegie raak in geïndustrialiseerde lande al hoe meer omvangryk. Die rehabilitasie en beroepsinskakeling van hierdie persone in rystoele raak 'n absolute noodsaaklikheid. In hierdie artikel word daar gekyk na die probleem, vanaf die akute fase tot die einddoel van rehabilitasie, naamlik beroepsinskakeling. Alle lede van die rehabilitasiespan word in die poging betrek.

INCIDENCE

- In Switzerland approximately 15 new cases per annum per million population.
- In Australia approximately 19 new cases per annum per million population.
- In America approximately 50 new cases per annum per million population. At present there is a population of about 125 000 spinal cord injuries with about 10 000 new cases a year.
- Based on these statistics there are approximately 12 500 paraplegics and quadriplegics in South Africa (Flint, 1978).

AGE AND SEX

- 70% under 40 years of age.
- Male/female ratio approximately 9 to 1 because males participate in more dangerous sports and occupations.

COST

- Paraplegia is expensive.†
- R54 000 - R90 000 in first year for acute rehabilitative treatment.
- Projected lifetime care for quadriplegic is R300 000 - R375 000 and for a paraplegic is R160 000 - R205 000.
- Estimated loss to the country in Gross National Product is R1 - R1.2 million per person affected.

Thus, it is very clear that rehabilitation of spinal cord injuries has become an absolute necessity and the concept of rehabilitation starts at the scene of the accident.

PREVENTION

The prevention of accidental injury comes by educating the public through the combined efforts of industry and government. Awareness of the importance of seat belts, the proper use of vaccines and the possibility of hereditary defects would help to lower the incidence of spinal cord disease.

CARE AND HANDLING OF ACUTE SPINAL CORD INJURY

At the scene of the accident correct care is essential. Further flexion of the spine must not occur and victims should be transported on firm stretchers. Preferably, they should be transferred to a specialised spinal cord injury centre within 48 hours of the accident so that rehabilitation can start immediately. Psychological trauma resulting from paralysis can also be dealt with better in these units.

† Figures based on cost of treatment in America.

REHABILITATION TREATMENT AT A SPINAL CORD INJURY

In these centres patients are taught and encouraged to achieve the greatest possible independence. Additionally, attention is paid to good skin care, bowel and bladder control, including an increased fluid intake to prevent the formation of kidney stones. Weight bearing for at least an hour or two a day is important to prevent the decalcification of bones. Bracing and exercise of joints may be necessary to prevent deformities. Muscle spasms can be very painful and the patient is taught to concentrate on the task at hand to try and overcome this problem as there is no ideal medicine or surgery available. Almost everyone with a spinal cord injury is plagued with the 'blues' and a psychologist or medical social worker may help to prevent or shorten this.

Today one of the most successful and typical rehabilitation programmes for spinal cord injured people exists at Harmarville Rehabilitation Center, Pittsburgh, Pennsylvania, U.S.A. and is therefore chosen as an example.

"We have made it our task at Harmarville to help the spinal cord injured patient and his family rebuild their lives, to adjust to the physical and mental problems that have befallen them. We offer no miracles or sure cure — just the opportunity to make the most of each patient's potential. Harmarville offers its patients post-acute rehabilitation, after the injured person's physical condition has been stabilised at an acute care facility. The Spinal Cord Treatment Center Program consists of four distinct phases, all designed to bring the individual patient to a more satisfying and productive life" (The Harmarville Story, 1979).

A closer look at the four phases of rehabilitation at the Harmarville Center revealed the following:

Phase I: Facing the Future

For the first week or two, the new spinal cord patient at Harmarville tries to come to grips with his situation. Many will never walk again, some only with crutches and braces. There will be complications in skin care and new things to learn about bowel and bladder control. The patient faces a future fraught with new realities, many of them unpleasant.

It is during Phase I in the Spinal Cord Treatment Programme that the Harmarville team approach (Harmarville Story, 1979), gets into action. Because each patient has unique physical and mental characteristics, the managing physician puts together a team of specialists designed to meet the patient's individual needs. The team works closely with the patient and his family to provide them with a general understanding of spinal cord injuries and a specific explanation of the individual injury. It is in this phase that instruction begins in skin care and complications, bladder and bowel care programmes, the use of medications and the basic therapy programme.

The team consists of the following services:

Medical: Heading the team is the managing physician who supervises the other team members and who, together with the general medical specialist, deals with the patient's medical complications during the programme.

Social Services: Liaison between the patient, family and team, discussing community resources (including follow-up services) and solidifying discharge plans.

Nursing: Works with the physician on rounds, teaches the patient how to handle skin care, bladder and bowel problems, in addition to providing general nursing care.

Psychology: Develops a psychological profile of the

patient to determine his intellectual capacity and emotional strengths. Also helps the patient to adjust socially and emotionally to his new life situation.

Vocational/Educational: Aids the patient in determining his vocational and educational goals and assists in re-entry into the community.

Physiotherapy: Evaluates the patient's strength, range of movement, wheelchair mobility, and ability to become mobile through a programme of muscle strengthening and re-education.

Occupational Therapy: Tests and maximises functional ability and provides orthotic devices to aid the patient in self-care and personal independence.

Recreation: Assesses what hobbies or sport the patient can perform, evaluates community accessibility for recreation and avocational activities.

Homemaking: Works with patient to teach self-sufficiency at home, evaluates and helps plan modifications needed in the home.

Dietary: Develops a nutritional care plan based upon individual needs, activities and preferences whenever possible.

The first phase generally lasts one to two weeks. By the end of that time, the rehabilitation team has a good idea of the patient's capabilities. A staff conference is held to map out a realistic programme to return the patient to his community. The patient, in turn, has come to understand his situation and is being prepared for the commitment needed to resume an active life.

Phase II: A Time for Rebuilding

The patient must be medically stable, relatively free of complications and have a good tolerance for either sitting or standing to enter the second phase. It is in this phase that the family and community become more intimately involved with the patient's care and the overall programme.

Heavy emphasis is placed upon physical and functional activities designed to get the patient ready for a return to the community. Physiotherapy continues working on range of movement, a programme of isometric and dynamic exercise aimed at strength, balance activities and instruction in transfers, weight shifts and wheelchair mobility.

In this phase the patient is provided with dynamic splinting, as needed, to aid self-care. Other supportive and adaptive equipment such as mobile arm supports, environmental control units, tape recorders, home exercise equipment and lower extremity bracing, are introduced in this part of the programme by occupational therapy and physiotherapy. Occupational therapy also explores pre-vocational potential and prospects for driver training.

A most effective tool used during this six-week period is socio-physical group therapy. All patients participate in a social event, such as mat exercises in physiotherapy. This programme enables patients to interact and gain first-hand understanding of how the overall programme works.

A Phase II patient has the opportunity to observe and experience how patients in Phases III and IV have advanced in the treatment programme during these types of socio-physical events.

An information buddy system also exists for patients' families so that they can learn from the experiences of those families who have completed the programme. This dialogue allows former- and new-patient family members to participate in discussions and constructive criticism of the programme and to review any difficulties encountered in the community. Social Services monitor these discussions to gain feedback on the treatment programme.

Weekly psychology group sessions also exist and enable patients to deal openly with such subjects as their handicaps, social barriers, frustrations, sexual functioning and transportation problems. Patients are encouraged to participate and express their feelings about the programme so they might learn from each other.

The initial visit home is the first tangible reward for the patient's hard work. It provides the opportunity for the patient to experience the reality of his new life situation outside the rehabilitation centre. Following that important first visit home, the rehabilitation team reviews the problems the patient encounters and devises ways to solve them. The Homemaking Department then schedules a home visit during Phase II and a home economist accompanies the patient to assess and evaluate what the patient will need to become self-sufficient at home.

The home economist analyses architectural barriers, determines equipment needs and meets with local people such as contractors and representatives of sponsoring agencies who will be involved with eventual modifications to the patient's home. For the first time, the patient and family can sit in on a patient staffing conference to review the progress of the rehabilitation programme and discuss those problems that have been encountered.

This conference usually is held after the home visit so that problems relating to patient care at home can be reviewed. By the end of Phase II the patient should be able to recognise and understand the specific medication and dosages he is receiving. The patient, with or without family assistance, should be able to handle weight shifts to prevent skin problems, do push ups and propel the wheelchair on even or uneven terrain.

Phase III: A Return to the Community

After six to eight weeks of the programme, the patient shifts into a third phase that places emphasis upon community resources. Outings with members of the Recreation Department give the spinal cord patient exposure to active life in the community. Using a newly acquired van designed to transport wheelchair patients, the recreation staff takes patients to restaurants, shopping centres and museums to help introduce or rebuild outside interests.

Special emphasis is placed on sport. The patients are exposed to a full range of lifelong sports that wheelchair patients can undertake. Those with particular interests are encouraged to compete in wheelchair sports.

These recreational outings also serve to expose the patient to any possible environmental barrier problems he may encounter and give him the chance to overcome them. Community leaders are invited to participate in the patient's discharge planning as an aid to providing recreational outlets for the spinal cord patient.

The Vocational Department accelerates its programme in this phase, placing the patient in either a former or new job. The co-operation of prospective employers in providing work opportunities and removing architectural barriers to make jobs accessible, is solicited.

Similar visits are made to schools for students seeking to resume their education. Vocational counsellors, along with home economists, meet with educators to aid the patient in the transition back to school. Working with the Vocational Department in getting patients back to work or school is the driver training and evaluation section. Each patient is evaluated according to

the level of injury and functional capabilities to see if he can resume driving or can get his licence for the first time.

In addition to providing direct driver training, the programme recommends the type of vehicle best suited for the patient and any adaptive equipment needed.

By now the patient should have achieved a functional level that can be maintained through continued physical therapy and exercise. Wheelchair tolerance should have increased from 6 to 10 hours. The patient should be able to make successful weekend home visits and should be able to lie on his face for 6 to 8 hours. The family involvement in the rehabilitation programme should have become more frequent and consistent. Family members should aid in therapy at least once a week and work with community representatives to aid the transition of the patient from Harmarville to home.

Phase IV: A New Independent Life

The spinal cord patient has reached the final stage: the transition to independent living. During his last week at the Center, the patient and his family take full charge of bowel and bladder care, skin care and medications. The patient and family are placed in the transitional living apartment in Harmarville. Their performance in independent living situations is tested to see how reliable they are.

The patient begins each day, just as he would at home, getting ready for work or school. Accompanied by a team member, he reports to work or school to see how a daily routine works out. By putting the patient in a practical situation, the team can evaluate how well he and his family manage on their own.

The day the patient is discharged from Harmarville his treatment is by no means over. He will return frequently depending upon his needs during the first year, following completion of the four phases.

The Visiting Nurse Association and other home health care services act as liaison between the Center and the patient, helping with exercises, physiotherapy, nursing and support services. Medical and urological follow-ups are done routinely twice a year to ensure the patient's overall condition is stable and controlled. As time progresses, these checkups are made once a year.

The Harmarville Spinal Program is a team approach which involves team members in all aspects of the patient's life. The patient is considered ready for the programme when he is motivated to commit himself to hard work and sacrifice towards a new life.

References

- Gregory, M. F. (1978). *Sexual adjustment — a guide for the spinal cord injured*. Accent on living, Inc., Birmingham, Ill.
- Meyer, C. M. H. and Malick, M. H. (1978). *Manual on management of the quadriplegic upper extremity*. Harmarville Rehabilitation Centre, Inc., Pittsburgh, Penn.
- Saltman, J. (1960). *A head, a heart, and two big wheels*. Public Affairs Pamphlet No. 30. Public Affairs Committee, U.S.A.
- The Harmarville Story (1979). *A special report: Harmarville's spinal cord treatment programme*. Vol. VII No. 1. Pittsburgh, Penn.
- Thompson, M. A. and Murray, W. A. (1967). *Paraplegia at home — a pilot survey of the management and rehabilitation of paraplegic patients in Scotland*. Livingstone, Edinburgh and London.