Rehabilitation after injury and the need for coordination

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The outcome of treatment after injury can be measured using the general terms of mortality and morbidity. Mortality is an all-or-none phenomenon, but morbidity is a graded response to injury and its medical treatment, varying from complete return to normality at one end of the scale to total dependence on other people requiring residence in an institution at the other end. The words disability (the individual's response) and handicap (society's reaction) specify the morbidity. Rehabilitation affects these two outcomes of disability and handicap and is a complex process involving the patient, carers and a team of specialists. The rehabilitation team is comprised of professionals each with specialist skills who aim to rehabilitate the individual as far as possible back to his former health and independence. All aspects of an individual's life are treated, including the physical, functional, psychological and social. The team operates in a number of ways according to the setting and treatment approaches used. The rehabilitation process should remain consistent throughout and focus on the patient's strengths and deficits. The key to effective rehabilitation is good organization with a comprehensive team approach working towards common goals and aims. Whether the patient is located in an acute hospital, rehabilitation unit, nursing home or in his own house, rehabilitation must be continuous. It is a mistake to believe that the rehabilitation process can only exist in a special centre; it must start in the acute hospital and be maintained even when at home, although its intensity may vary at different stages. It is suggested that coordination of this continuous process should be done by a rehabilitation coordinator, who must commence work early in the acute phase after the initial injury. Monitoring the amount of disability and the effectiveness of the rehabilitation process is essential and is best performed using the Functional Independence Measure. This simple scale can help to assess progress by nurses, doctors, therapists, and carers. It must be made part of the therapeutic process and utilized to fix goals. It can also act as the outcome measure to assess the cost effectiveness of rehabilitation after injury.

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Defining disability and rehabilitation

In 1980 the World Health Organization defined impairment, disability and handicap (WHO, 1980). Impairment is the preferred term for describing the original injury or pathology and the causes may be physical or psychological, involving any or all parts of the body. Disability is a restriction of ability or inability to perform everyday activities involving self-care, household activities, leisure and work. Disability is essentially the individual's own response to impairment, i.e. a part of morbidity. It is important to be clear about the distinction between disability and handicap since these words in this context are often mistaken and confusingly used as synonyms. At its simplest, the word handicap is concerned with the patient's relationship with other people, life roles and the individual's place in society. The individual himself may be handicapped by an impairment or by a disability, and additionally society may handicap the individual by its attitudes, politics and economics. Such definitions provide a useful basis for classifying the consequences of traumatic injury, but measurement of these three terms is both difficult and controversial. The International Classification of Disease (WHO, 1977) and the Abbreviated Injury Scale...
The rehabilitation process

Rehabilitation must be seen as a continuous process from the pre-hospital phase when the doctor, paramedic or ambulance crew strive to prevent any further deterioration in the patient's health after injury, through the acute hospital phase and into the community. Rehabilitation should commence early after the accident and should be provided by a team and not just one person. The team consists of nursing and medical staff, dieticians, personnel from occupational therapy, physiotherapy, speech therapy, social workers, and may also include a psychiatrist and psychologist. The organization of such teams varies according to their treatment approach and the setting in which they work.

The patient and family must be included because their motivation, support and contributions help in setting the goals of treatment. The process of rehabilitation should remain consistent, beginning with an assessment of the patient's disabilities and then establishing a plan with overall goals and aims of treatment. Rehabilitation aims to facilitate recovery, maintain the patient's current condition and prevent deterioration. Throughout therapy, the patient's progress should be regularly evaluated to provide the best adaptation possible to any difference between roles achieved and roles desired.

Team roles

The type and amount of treatment from each of the different professionals varies according to the patient's diagnoses, stage of recovery, age and rehabilitation setting. The doctor usually assumes responsibility for the patient's overall care and treatment. Decisions taken in theatre by surgeons can affect the progress of rehabilitation. Physiotherapists provide specialized respiratory therapy, maintain and develop a range of movement and muscle strength including coordination and mobility. Occupational therapists focus on functional skills such as self-care activities, progressing on to the more complex tasks involved in the areas of household, leisure and work skills. Speech therapists provide alternative means of communication, develop speech and language abilities and include swallowing advice and therapy. The psychologist provides cognitive evaluations and helps to establish behaviour therapy programmes when required. Nursing staff may reinforce these therapy programmes and are responsible for bowel and bladder training. The psychiatrist and his team provide support for the mentally ill patient who may have tried to commit suicide or who is suffering from neurosis or psychosis. The essence of a good team is one in which the overlapping grey areas of shared abilities and skills between members are acknowledged and used constructively.

Rehabilitation Coordinator

There is a need for someone to coordinate the efforts of the team to arrange optimum rehabilitation for every injured patient and ensure that goals are met through consistent treatment by the whole team. It would seem sensible for this same person to be responsible for the measurement of disability, using the Functional Independence Measure (FIM). That does not necessarily mean that all the different elements of the assessment should be done by the same therapist because parts are more appropriately done by nurses, physiotherapists, occupational therapists, psychologists or social workers. But the coordination must be under one person's control and the goal setting can be part of a consensus agreement.

The different places where rehabilitation takes place are in the acute hospital, in a secondary hospital, a rehabilitation centre, a nursing home or in the community. It is suggested that the disabilities are monitored using FIM at various times during recovery: (i) within 3 days of arrival of admission; (ii) weekly in the acute hospital; (iii) before discharge. (iv) at 3 months, and (v) at 6 months after the initial injury.

It would appear unnecessary for a rehabilitation coordinator to have a medical qualification but training in one of the therapy disciplines or nursing would be an advantage since close cooperation with the whole of the team as well as the patient and relatives is essential. The philosophy behind the use of a rehabilitation coordinator is that one person in the acute hospital assumes responsibility for the continued interest in the injured patient even though he may be in some other geographical location. Lessons gained from good follow up can improve the standards of care in the acute phase of treatment.

The following are considered to be the essential components of a rehabilitation coordinator's job:

In the acute hospital

(a) Improve the present uncoordinated referral system for the therapy services;
(b) coordinate therapy in the acute bed by good communication systems, regular meetings, handovers and sharing of information;
(c) develop and implement rehabilitation policies for the hospital;
(d) establish a designated multidisciplinary team for injury patients;
(e) perform and monitor regular use of FIM assessments;
(f) plan treatment with agreed goals in the acute hospital.

On discharge

(g) Find the appropriate setting for transfer or discharge from the acute hospital;
(h) perform an assessment and arrange treatment plans...
Rehabilitation in the acute hospital

For most major injury patients, rehabilitation begins in the intensive care or injury unit where the immediate priority is saving lives; but the prevention of secondary complications such as contractures, oedema, infections, ulcers, thrombosis and emboli is also part of rehabilitation because the development of deformities adds to the original injuries and can seriously affect recovery. Close attention must be paid to nutritional needs to prevent weakness and malnutrition (Meguid et al. 1990). Patients in coma require specific programmes based on sensory stimulation designed to regain consciousness and to promote consistent responses. In the acute hospital such rehabilitation is usually provided in the patient’s ward because he or she is usually too seriously ill for moving to the physiotherapy department or gym.

In the UK, in-patient rehabilitation teams are organized either according to specialty (e.g. orthopaedic or neurosurgery) or according to ward specialty (e.g. Intensive Care Unit or injury unit) and the consultant in charge of a single specialty usually assumes responsibility for the patient and directs treatment. But this is not a practical solution when the multiply injured are under the care of different specialist teams. Confusion between the teams involved will be inevitable unless communication is good. Close attention to the patient’s other injuries. It is essential to have flexible coordination of the treatment and rehabilitation goals especially when the rehabilitative therapy for one injury is contraindicated by another. In such circumstances written and verbal reporting between all the members of the team must be good. The role of a rehabilitation coordinator such as that adopted by the injury surgeon in the USA is one that cannot be underestimated in terms of obtaining effective rehabilitation.

Out-patient rehabilitation

Patients continue to receive medical treatment and rehabilitation in hospital until they no longer require daily nursing care and are sufficiently independent and safe in mobilizing and self-care skills to be discharged. If necessary the patient can then continue therapy on an out-patient basis or may receive therapy at home from the community services. In addition, for the less-able patient, community nursing and social services can help in the provision of additional support (home helps and meals on wheels) and in arranging adaptations and equipment for the home. The recent changes in community care have yet to be absorbed and translated into better treatment, but serve to emphasize that coordination is extremely important.

Rehabilitation wards and units

Patients whose condition prohibits them from returning home without further rehabilitation may be transferred to a rehabilitation ward or unit. Funding for such units is scarce and beds so limited that each has its own selective admission criteria. The full effect of both the purchaser/provider split and fund-holding GPs on the decision whether to buy rehabilitation has not yet been assessed. The goal of rehabilitation units or wards is to increase the patient’s independence (a) in the home - self-care skills and housework; (b) in the community - shopping and travelling skills; (c) at work; and (d) with leisure, activities. By retraining, education and adapting, they enable the patient to become as independent as possible given the limitations of their condition.

Therapy is provided each weekday with the evenings free for recreational activities which may be supervised. A rehabilitation co-ordinator is often employed in such units to lead the team and organize treatment programmes but the role is frequently adopted by the consultant in charge. Patients remain in the unit full time until ready for discharge. Often rehabilitation units have flats or bungalows into which patients can move in preparation for discharge once they have reached a suitable level of independence. Then patients may go home for weekends in the period leading up to discharge to enable a more gradual readjustment to home life for both the patient and his family.

There are no NHS or private rehabilitation centres specifically for trauma in the UK, but in the south east of England, RAF Headley Court is an outstanding institution specializing in rehabilitation for any type of trauma. Originally a manor house built in the 19th century it has been developed and expanded for all members of the armed services with about 96 per cent of the patients being military personnel.

Treatment intensity is high, aiming at a rapid recovery with 5 h therapy each weekday and an average length of stay of 27 days. The young, well motivated patients aged 19 to 35 years tolerate this intensive regimen with which they rehabilitate back to full health in half the time that it would take in the NHS. This unit is funded by the Ministry of Defence, not the NHS, and costs are unavailable.

Nursing homes

Patients showing minimal progress may eventually be transferred to a nursing home where rehabilitation aims to reduce the deterioration in physical and mental health which can develop in the severely disabled. These patients usually require more nursing care than it would be
Rehabilitation effectiveness

There are no recommended nor established guidelines for the amount or type of rehabilitation required for each condition. There has been a general acceptance of the usefulness of the 'team' in rehabilitation but there has been very little research into the organization and effectiveness of such teams and their approaches to treatment. The lack of an agreed, standard rehabilitation measurement for recording the progress of patients from disability to ability through treatment also makes analysis difficult.

The rehabilitation process should remain consistent but the lack of a definitive rehabilitation strategy is confirmed by the wide variation in both the intensity and type of rehabilitation offered to patients in the UK. For example, as an in-patient in one hospital the amputee may be sent for special amputee rehabilitation classes in the gym for 4 h a day while in another hospital he may only receive conventional physiotherapy for 2 h daily or less. The Health of the Nation report states 'rehabilitation is an integral part of medical practice' and goes on to say, 'it is a designated specialty in its own right providing services aimed at the restoration of optimum functioning following illness or injury irrespective of the cause.' (Department of Health, 1991). Rehabilitation then, would appear to be an accepted part of medical practice and the need for it established. However a Royal College of Physicians (RCP) report (1990) on health services for disabled people found that 48 per cent of NHS health districts did not provide any consultant sessions for the assessment and rehabilitation of disabled people, 56 per cent had no units for the young disabled and 73 per cent had no special services for head injuries. Amputees were even worse off, with 81 per cent of health districts lacking special services for them (RCP, 1990). There is little evidence of what is an appropriate amount of therapy for any particular diagnosis. In the USA Diagnosis Related Group-exempt rehabilitation units are required by federally mandated guidelines to provide at least 3 h of rehabilitation per day. Most reimbursement is paid on the basis of coding the original injury and then combining patients into 'comparable' diagnostic related groups for costs, so this is an attempt to pay equitably for rehabilitation regardless of diagnosis. The Buffalo Hospital rehabilitation unit in New York State is a good example; it caters for neurological, neurosurgical and orthopaedic patients and provides 3 h of rehabilitation each day with self-care activities continued beyond these times in a residential unit. In the UK most of the information about the amount of therapy provided in a course of rehabilitation has been provided by studies on patients who have had a stroke, with figures varying from an average of 62 min (Tinson, 1989) to 45 min per day (Wade et al., 1984). There is no such information for injured patients in the UK. The matter is complex because the measurement of how much rehabilitation is effective is dependent on the type and severity of the disability, its prognosis and many other factors. Spontaneous recovery must also be accounted for in any analysis. The question of whether rehabilitation after injury is worthwhile needs further research. A study of severely brain injured patients compared two groups, one of which received rehabilitation and the other did not. The rehabilitated group were more seriously injured but had better outcomes and lower costs than the other group (Aronow, 1987). The value of treating the most severely multiply injured patients has been investigated in another study (Kivioja et al., 1990). Patients defined as having injuries to at least four body regions with a mean Injury Severity Score (ISS) of 39 (seriously injured) were followed up for between 5 and 20 years after trauma. Of these patients, 91 per cent managed at home without outside help and 72 per cent had been able to return to work, demonstrating that the effort certainly appears worthwhile (Kivioja et al., 1990). Evidence already exists to support the need for early rehabilitation of head-injured patients, the benefit of which is seen in a shorter length of stay in acute hospital rehabilitation (Cope and Hall, 1982). Only when rehabilitation costs have been established and the outcome measures agreed can cost-effectiveness be accurately assessed. The words 'cost-effective' must mean that added costs achieve worthwhile benefits and not that reduced costs produce minimum benefit. The median cost of an injured patient coming to The Royal London Hospital by helicopter and treated for a median stay of 10 days is about £10,000. These costs include the total hospital costs, nursing, therapy and medical fees but exclude pre-hospital treatment and transport. There are almost no other published costs for trauma in the UK so data have to be extrapolated from USA figures where costing systems are established by private health insurance. In 1990 the calculated average rehabilitation unit charges were £500 per day (Parfenchuck et al., 1990). In 1991, the total medical cost of care for a moderate brain injury alone in the year after injury was $12,489 but a severe brain injury with additional abdominal and thoracic injury increased this figure to $110,385 (Seigal et al., 1991). These costs included ongoing rehabilitative therapy and additional expenses for the multiply injured. Cost-effective treatment models for head-injured patients are being evaluated in the USA by the National Institute for Disability and Rehabilitation Research Model Systems Program (Thomas, 1988).

The cost of major injury

There is controversy over the true cost of a young adult dying after injury because there are different methods of calculating the financial costs to the individual's family, dependants and society. The figures given by the Ministry of Transport and the Department of Health vary between £500,000 and £750,000. Similarly the costs of those patients who survive are controversial, with the sum made up of the acute hospital medical bills, the subsequent care at home or in an institution and costs of short- or long-term disability.

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