

## BEHAVIOUR MANAGEMENT TECHNIQUES FOR ORGANIC PSYCHOSOCIAL DEFICIT INCURRED BY SEVERE HEAD INJURY

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**ABSTRACT.** Subgroups of severe head injured patients exhibit patterns of organic psychosocial deficits resulting in behavioural disturbances. Behavioural management techniques are discussed and two case illustrations are presented in detail: a physically disabled but cognitively well preserved patient who refused to cooperate with therapy programmes; and a permanently severely physically and cognitively disabled patient who screamed and was assaultive whenever physical proximity or contact occurred.

*Key words:* head injury, brain damage, rehabilitation, behaviour modification.

The severe head injured are a heterogenous group, the deficits arising from their brain damage often resulting in a bewildering variety of patterns of dysfunction, usually involving a combination of motor-sensory, cognitive and organic psychosocial impairments. The organic psychosocial deficits resulting in behaviour disturbance and issues relating to their management have been discussed in this volume (3).

Goal setting and methods of goal attainment in behavioural programmes for the head injured depend very much, in the first instance, upon an understanding and appreciation of the limitations imposed by the nature, severity and duration of deficits, the level and extent of remaining intact neuropsychological functions, the patient's and his family's insight into the deficits and future aspirations and their readiness to accept what may appear to be radical, insensitive and confronting ways to deal with behavioural disturbances. Such factors will vary between patients and mitigate for an individual programme to be constructed which will be unique for each patient. Without sufficient consideration given to each of these issues, behavioural programmes may easily founder simply because they are inappropriate for a particular patient at a given time following his injury.

Although the individual variation between head injured victims is large, there are a number of rep-

resentative groups which stand out as presenting particular management problems in the behavioural sphere during the rehabilitation process and thereafter. These groups are representative of different time stages after head injury, and they generally experience similar patterns of neuropsychological impairments:

Group 1: those who have relatively insignificant physical deficit, but are disorientated, confused and sometimes disruptive;

Group 2: those who have significant physical and cognitive deficits, but who gradually improve over a prolonged time period;

Group 3: those whose physical, cognitive and/or organic psychosocial deficits are so severe that they are dependent upon others for care in the longer term.

### GROUP 1

The first category typifies an important subgroup of patients after severe head injury whose cognitive and psychosocial recovery lags significantly behind rapid physical improvement, and who often exhibit contingent behavioural disturbance. As they emerge from coma these patients may be literally walking disasters and they are difficult to nurse and manage at ward level. Their behavioural problems generally improve once out of the period of post-traumatic amnesia or the confusional state, but until this stage is reached they may present critical management difficulties if they are not to be scheduled to a psychiatric centre or heavily sedated.

Behavioural deficits exhibited by patients in this subgroup are closely related to disorders of control: the patient is highly distractible, restless and uncooperative. He has a lowered frustration tolerance and may shout, swear or become aggressive when he cannot have his own way. If the patient is mobile, then such deficits are difficult to ignore, since he will wander in an aimless and sometimes disrupt-

tive fashion around the ward. Generally, their distractibility and impaired attention span make these patients poor candidates for traditional therapies, and their reduced insight results in their failing to appreciate the reasons for their hospitalisation.

The range of techniques available to manage the patient in post-traumatic amnesia are largely dependent upon environmental and staffing constraints of particular health care and rehabilitation systems (2). Wherever possible attempts should be made to manipulate the environment, rather than the patient, who generally does not possess the ability to monitor and regulate his own behaviour. Direct, calm, consistent interaction from staff reduce the patient's feelings of bewilderment. The use of simple timetables, structured such that demands are commensurate with the nature and severity of deficits, help to bring order and time sequencing to his world view and have the added advantage of reinforcing for staff the expectations that can be realistically placed upon the patient. However, the degree to which the grossly aberrant behaviours occasionally observed can be tolerated, will be a function of the environmental conditions of the unit, including other patients' and their relatives' ability to tolerate socially inappropriate and/or unacceptable behaviour.

## GROUP 2: CASE REPORT PATIENT M. T., AGE 18

### *Background*

Another large group of severe head injured victims are those who experience marked physical deficits and consequently have a long period of rehabilitation. As with many patients from this group, cognitively oriented functions can be, relative to the motor-sensory disabilities, well preserved. Although M. T. demonstrated gradual improvement, by 12 months post-trauma she had attained only a modest degree of recovery, remaining severely disabled. Her slow progress, together with a deterioration in behaviour, raised the question as to whether she was no longer benefiting from rehabilitation and should be discharged home.

When, as a pedestrian, M. T. was hit by a car, she sustained an open head injury and was comatose for 25 days. C. T. scan demonstrated predominantly right hemisphere damage. By 12 months post-trauma, M. T. still evidenced spasticity and marked physical deficit in all

four limbs and dysarthria. Functionally she was unable to walk, talk coherently or use her right hand. Neuropsychological assessment revealed that while primary cognitive skills such as attention, memory, language and perception were functionally intact, she did demonstrate significant impairment of her adaptive abilities with poor regulatory abilities and impaired planning and organisational skills. These deficits were superimposed upon an organic inertia. The picture was further complicated at 15 months post-trauma, when M. T. became notably demoralised and depressed. At this point in time she became unable to maintain the level of co-operation required for therapy sessions to proceed and her unco-operative behaviour generalised beyond the therapy situation to the general ward environment. M. T. threw temper tantrums whenever her therapy sessions were imminent and ultimately she refused point-blank to co-operate with all staff, both in and out of therapy.

### *Behavioural management programme*

Management programme:

Positive reinforcement with tokens

Target behaviours:

- i. attend therapy sessions
- ii. attempt therapy tasks
  - transferring from wheelchair
  - eating with utensils
  - wheeling chair bilaterally
- iii. carry through therapy activities outside therapy time.

Programme initiated:

15 months post-trauma.

M. T. was given a token by staff rostered for each of the activities attempted at the stipulated time in her daily programme. The programme was structured such that she was to transfer a total of 9 times per day, eat with cutlery at all meals and wheel herself between the ward and the therapy area, a distance of 20 yards, twice a day.

She could cash in her accumulated tokens for a reward. The reward system was previously negotiated with M. T. and initially comprised a selection of six rewards ranging from a phone call costing 10 tokens to an outing such as a movie, costing thirty.

M. T.'s response to the programme was dramatic as demonstrated by Fig. 1. Her good performances enabled a fortnightly review and upgrading of the programme. Quality of response became a feature of later programmes, and this could be achieved by a highly structured method. For example, M. T. was given an extra token for walking "very well", "very well" being defined as "head up and hip

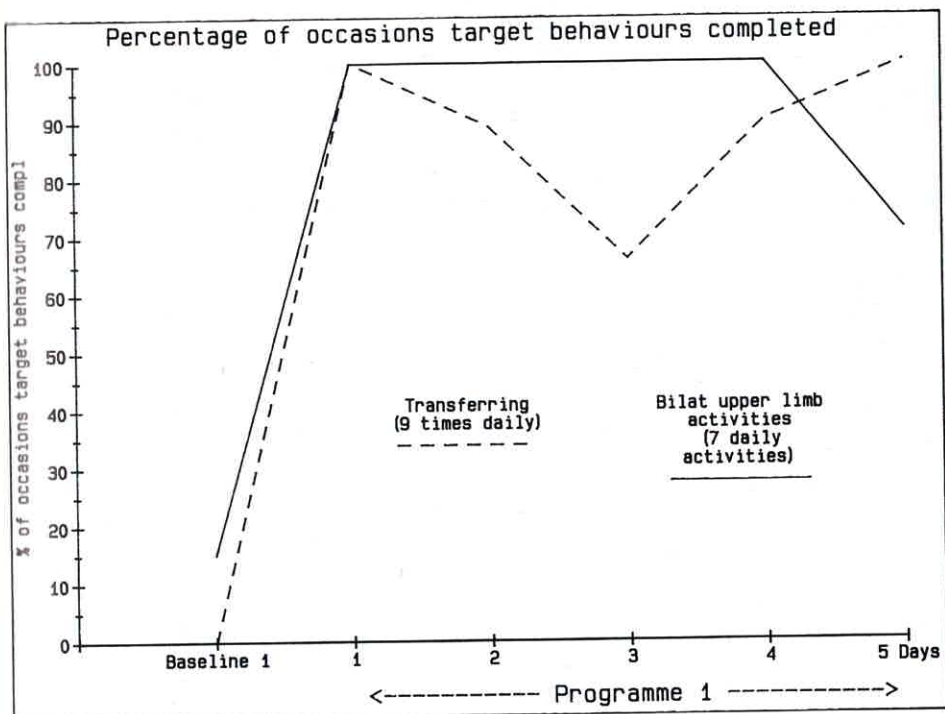


Fig. 1. The percentage of occasions the target behaviours (transferring and bilateral upper limb activities) were com-

pleted prior to the introduction of the programme (Baseline) and days 1 to 5 of Programme 1.

forward". In this way the shaping of her responses improved her performance.

### Discussion

Given the severity and long standing nature of M. T.'s deficits, complicated by a depressive functional reaction, significant constraints operated for the initial goals of the programme.

Errorless learning has been noted to be an important adjunct in the success and attainment of programme goals with the brain damaged population (1, 4) and even with patients such as M. T. who are severely disabled with a functional overlay, it is possible to construct fail-proof programmes. For these reasons the initial target behaviours were carefully chosen and prior to the programme were negotiated with M. T. Only those behaviours which she could accomplish, however imperfectly, but was reluctant to engage in, were targeted for change. Attempt at the target behaviour was therefore the criterion for success, rather than completion of the behaviour. Once errorless learning had been accomplished at the initial stage, the target behaviours were then upgraded, requiring comple-

tion of the activity as the criterion of success, and later, competent completion of the target behaviour. When this stage had been attained, old target behaviours were replaced by new ones, e.g. transferring was replaced by standing balance and so on.

Cases such as M. T.'s raise important issues about maintenance. Often behaviours targeted for change, particularly with the brain impaired, can be successfully attained while ever the programme is operative, but the new behaviours are not permanently sustained. After two weeks, when M. T. was consistently eating with cutlery without prompting, the token for the activity was terminated, but monitoring of the behaviour continued.

Within one day it fell back to the baseline level of eating with a spoon only. When the tokens were reinstated, she ate with cutlery. Two months later, however, the tokens for eating with cutlery were again terminated, but this time there was no fall off in the activity. Overlearning has been stressed (5, 6) as a crucial component of behaviour programmes with the brain damaged, if the behaviour targeted for change is not to revert to baseline once the programme has been terminated.

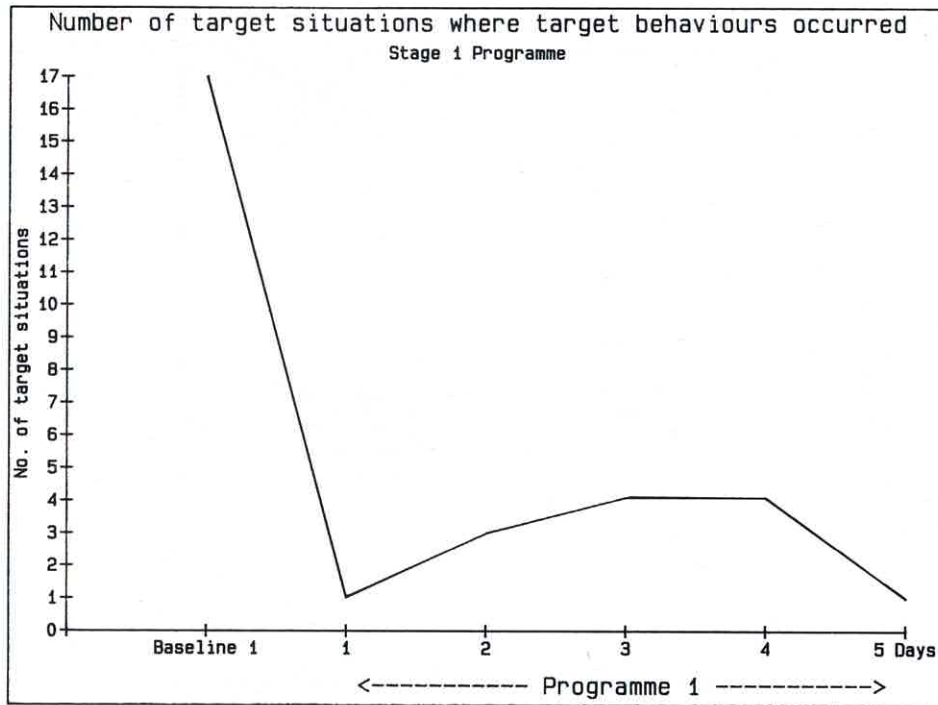


Fig. 2. The number of target situations (eating and transferring) where the target behaviours (screaming and bellowing at any time, grabbing and hitting people and throw-

ing things) occurred prior to the introduction of the programme (Baseline) and days 1 to 5 of Programme 1.

M. T.'s programme was terminated after six months, by which time she was walking with a frame, both in therapy as well as other settings, including the ward and home. M. T.'s access to premorbid activities (i.e. walking rather than being wheelchair-bound) resulted in increased self-esteem and has been an important factor in maintaining the acquisition of positive behaviours.

### GROUP 3: CASE REPORT: R. W., AGE 30

#### Background

Unlike the group 2 patients whose severe physical disability can be expected to show gradual improvement over time so that discharge home to the family with independence in basic activities of daily living is the aim of rehabilitation, the future for group 3 patients is likely to be permanent placement in a nursing home, as a result of continuing marked disability.

R. W. sustained his severe head and orthopaedic injuries as a result of a motor cycle accident. He was comatose for some 5 weeks and C. T. scan reported a midbrain and basal ganglia haemorrhage on the left. Diffuse cerebral oedema and cortical atrophy were also evident. R. W.

spent most of his first 11 months post-trauma nursed in isolation as a result of a series of multi resistant staphylococcal infections. At 12 months post-trauma he was severely disabled with a right hemiparesis and marked dysarthria with no speech. He was, however, able to follow simple commands. R. W.'s aggressive verbal and physical behaviour, which he exhibited whenever he was approached, made his nursing management extremely difficult and future placement in a nursing home unrealistic. He would scream and bellow, grab and hit nursing staff whenever physical contact occurred, such as transferring, washing, dressing and feeding and would throw anything put before him, such as plates of food, urinal bottles etc.

#### Behaviour management programme

##### Management programme:

Differential reinforcement of behaviour. (Tokens and time out)

##### Target behaviours:

- grabbing and hitting people
- throwing things
- screaming and bellowing at any time

##### Target situations:

- eating
- transferring

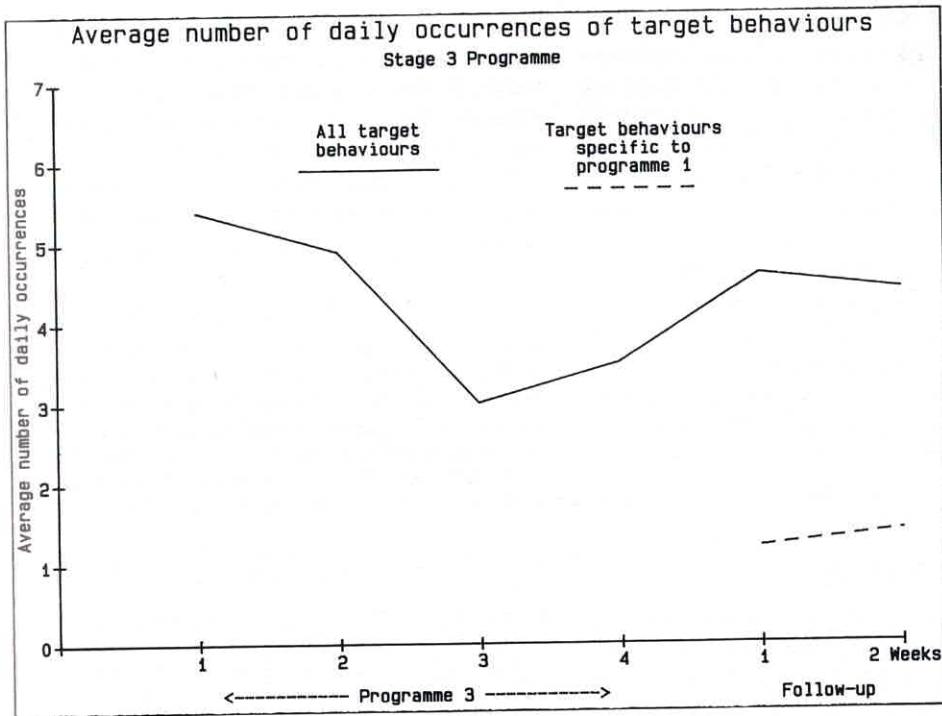


Fig. 3. The average number of daily occurrences of the target behaviours (screaming and bellowing at any time, hitting and grabbing people, throwing things and soft grumbling noises) for weeks 1 to 4 of Programme 3 and

weeks 1 to 2 of the 2 month follow-up. The broken line in weeks 1 to 2 of the follow-up represents the behaviours specific to Programme 1 (i.e. all behaviours excluding soft grumbling noises).

Programme initiated:  
13 months post-trauma.

Because of the long standing severity of his behaviour disturbance R. W.'s programme utilised a differential reinforcement approach, so that he was positively reinforced with tokens if the target behaviours did not occur in the target situations and, simultaneously, he was negatively punished with his removal to the Time Out room for 5 min if the target behaviours did occur in the target situations. Tokens were cashed in at the end of each day. If R. W. earned the required number of tokens (at least 12 of a possible 17 for his initial programme) he was given a can of low alcohol beer, following his evening meal, which he had previously indicated he would like.

17 daily target situations that were amenable to a behaviour programme were chosen, including transferring from bed to chair for the morning shower, dressing, toileting, eating breakfast and so on. Fig 2 demonstrates the marked reduction in the target behaviours occurring in the target situations.

With R. W.'s good response to the initial programme it was possible to upgrade it and include other target situations. His token system was also reviewed, such that he was only permitted to lose three tokens before forfeiting his can of beer.

The programme had been operative for 2 months with good reduction, though not total absence, of the target behaviours. At this point the third stage of the programme was initiated. It had been observed that R. W.'s screaming and bellowing had been replaced by soft grumbling and growling noises. An alternative communication system had been introduced to enable R. W. to make his needs known, but he had been unable to learn to use it. An attempt was therefore made to eliminate or reduce the noises that he made, but after 4 weeks the programme was abandoned without any significant success in the amelioration of this particular behaviour disturbance, which averaged some 5 daily occurrences.

Two months following completion of the programme R. W.'s behaviour was monitored for 10 days. Fig. 3 demonstrates a comparison of the fre-

quency of all the behaviours targeted for change (i.e. hitting, grabbing, screaming, bellowing, throwing things and soft grumbling noises) for stage 3 of the programme (weeks 1 to 4) and the observations made 2 months later. No significant increase in any of the target behaviours had occurred with the result that his nursing management was made much easier.

The remission of his behaviour disturbance permitted R. W.'s placement in a nursing home for young disabled people. Although R. W. continued to make soft grumbling noises in the target situations, this behaviour was considered to be inconsequential, both with the nursing staff on the ward, and later, with the staff of the nursing home to which he had been discharged.

### CONCLUSIONS

There is mounting evidence to suggest that behavioural approaches to the management of organic psychosocial deficits are a useful adjunct in the rehabilitation of severe head injured patients. Programmes may be used in a variety of ways, either to encourage or reduce particular behaviours. This may be an end in itself or used as a method to make the patient accessible to physical or other therapies, where the contingent behavioural disturbances preclude remediation attempts.

Not all behaviourally disturbed head injured patients are suitable candidates for formalised behaviour modification procedures (2), the most notable subgroup for whom caution is advised being those in post-traumatic amnesia. At this stage, when the evidence for maintenance of behaviour change in the long term has not been closely addressed, the choice of particular head injured patients for behavioural procedures is an important consideration.

Finally, it has been stressed that the implementation of behavioural programmes is subject to limitations imposed by the nature and severity of the brain damage, and the success of such programmes is dependent upon formulating a feasible plan which is negotiated with staff, the patient and his family, since most programmes require the active co-operation and participation. It is also necessary that programmes can operate within the confines of the rehabilitation system without unnecessary disruption.

While behavioural programmes do not "cure" organic psychosocial deficit, their strength lies in the creation of an optimal environment wherein, for example, the patient with a disorder of drive is provided with appropriate incentive to complete tasks, and the patient with a disorder of control is given a structure whereby he is accountable for his actions which have certain consequences.

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