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The comprehensive care of the moderately to severely head injured patient

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Rehabilitative techniques used for stimulating the patient include:
(Cross, 1977; Snyder & Jackie, 1981; Sherry, 1982; Tucker et al., 1984).

- Subject the patient to a conducive environment.
- Switch the lights off at night.
- Avoid sedation unless absolutely necessary.
- Employ reality orientation.

  According to Evans (1981), the presence of relatives around the bed helps the newly injured to establish contact with reality. Fölscher (1974) suggests that visitors should be strictly limited and perhaps even only view the patient from a distance. The researcher supports the belief of Evans (1981) and agrees that relatives must be incorporated in the re-orientation of the patient.

  Methods employed for reality orientation include:

  Begin re-orientation and re-association as soon as possible.

  Talk about familiar topics.

  Re-orientate to time, place and person.

  Orientate to body signals.

- Interaction with others.
- Talk to the patient.
- Mobilise the patient as soon as possible:

  Get the patient out of bed.

  Commence sitting programme.

  Walk the patient.

- Sensory stimulation:

  As soon as the cerebral oedema has subsided all five senses must be utilized.

- Let the patient feed himself/herself.
- Play games with the patient.

As recovery is a dynamic process aspects of recovery plateau at different times (Jennett, et al., 1981). Motivation is an important aspect in physical, psychosocial, emotional and vocational rehabilitation.

"A patient is said to be motivated towards rehabilitation if he shows a strong desire to become independent... If he fails to do this, he is said to lack motivation." (Hirschberg, et al., 1976: 55)

This is not always true of the head injured patient who due to the injury may lack motivation and insight.

Rehabilitation techniques employed to maintain motivation:

- Frequent encouragement and praise. It is important to maintain the patient's hope systems and to encourage a positive attitude.
- Positive re-inforcement.
- Feedback of progress.

  According to Hirschberg, et al. (1976), it is the physician's responsibility to discuss the patient's prognosis and progress with the patient and family. The paramedical and nursing team must communicate the patient's fears and anxieties to the physician.
- According to Allen and Moschak (1981), it is important to record the patient's progress on a chart so that the patient can visualise improvement experienced over days, weeks, or months. Charts suggested include:

  A daily ambulation chart.

  Individual (over one month) and group cumulative records (for comparison).
- Achievement in itself is a motivational force.

  The use of games as part of the rehabilitation programme may provide positive re-inforcement, rewards and pleasure and thus be a motivating factor for progressive rehabilitation (Evans, 1981). Series and Lincoln (1978) suggest the use of graphic representation as a positive re-inforcer to aid motivation.

Although for successful rehabilitation, stimulation and motivation are essential programme components Snyder and Jackie (1981) warn against the possibility of over-stimulation and fatigue.

(iv) Improvement of physical fitness (Hirschberg, et al., 1976).

According to Nichols (1975), active rehabilitation encourages people to overcome the disability by increasing physical attributes such as strength, range of movement and by changing techniques to accomplish activities such as dressing and walking. The purpose being to restore maximum function to all parts by using graded activities that promote recovery (Jennett & Teasdale, 1981).

Rehabilitation techniques used to improve physical fitness include:

- Active and passive exercises, breathing and swallowing exercises.
- Physiotherapy.
- Remedial gymnastics.
- Occupational therapy.
- Mobilisation, development of sitting, standing and balance.
- Sport and recreational activities.

(v) Training in self-care activities.

The patient must be trained for maximum independence (Hirschberg, et al., 1976; Orem, 1980). It is important to help the patient to compensate for the limitations imposed on self-care activities.

Methods used to restore self-care include:

- Physical conditioning to increase strength and range of motion.
- Training/Instruction in self-care techniques:
  - Bathing/Washing.
  - Eating.
  - Dressing.
  - Toilet activities.
  - Miscellaneous hand activities.
- Use of assistance devices.
- Use of adaptive equipment and modifications of clothing and living arrangements.

(vi) Training in activities of daily living (A.D.L.).

Assist the patient to achieve maximum independence in A.D.L. (Hirschberg, et al., 1976).

(vii) Ensuring maximum psychological functioning.

According to Rotkovitch ((ed.) 1976), Kuhbler Ross's stages of the grieving process mark the milestones in the patient's journey to recovery. According to the researcher, the head injured patient proceeds through these stages within the scope of the remaining mental faculties. The use of the "grief frame" helps the patient to realise his potential and limitations, to achieve the goals set and to lead a fuller life (Rotkovitch, (ed.) 1976).

It is important for the health team to offer emotional support to the patient and significant others and most important to understand their actions and reactions. Rotkovitch ((ed.) 1976) adds that the patient experiences a loss and therefore does not feel whole, thus it is important for the rehabilitation team to adopt a positive holistic approach to the patient. According to Riley and Moses (1977), long after the acute phase of care has started patients still have fears and anxieties. Rose (unkown) adds that behaviour problems occur commonly, in the early stages or on admission to the rehabilitation unit.

Strategies employed to lessen the psycho-emotional effects of head injury include:

- The intervention of the neuropsychologist early in patient management must be stressed (Long, et al., 1984). Neuropsychological assessment to assess higher level

functioning and cognitive abilities (Ozga, 1978; Caplan, 1982) and for psychotherapeutic intervention is essential. Intensive co-ordinated neuropsychological rehabilitation is imperative (Prigatano , et al., 1984).

- Maintain an environment conducive to psycho-emotional well being:

  Because the mental component of disability is to the fore after injury the creation of an environment that is understanding, stimulating and well structured is necessary (Jennett & Teasdale, 1981; Hirschberg, et al., 1976).

  All those dealing with the patient must be pleasant, attentive, caring and must be guided by the following maxim:

  'To do no harm and no matter what the patient's state of consciousness is, to believe that he understands what is said.'

  The staff must be aware of actions, reactions, verbal and non-verbal communication.

  Everything that is done for the patient must be done with the minimum of unpleasant reaction.

- The nurse must listen to the patient and allow the patient to verbalise fears and anxieties.
- Early mobilisation of the head injured patient encourages early independence, maintains self-esteem and hastens psychological rehabilitation (Rimon, 1979).

(viii) Cognitive retraining.

Memory retraining is advocated in the management of the head injured patient. Mahoney (1980) and Levin, et al. (1982) suggest that physical therapy and cognitive stimulation should be instituted at the earliest possible time. Cognitive retraining involves higher level functions relating to perception, concentration and memory. Levin, et al. (1982) assert that an impairment of memory makes rehabilitation difficult. Hirschberg, et al. (1976) add that the types of brain damage chiefly responsible for failure of rehabilitation are those that cause disturbances of perception, processing, orientation, memory and integrated thinking. According to Rose (n.d.), deficits of memory and data processing may be small but make a major difference to planning of and response to the rehabilitation programme.

Treatment modalities for cognitive deficits include:

- Relieving anxiety and fears.

  Talk to the patient (Evans, 1981: 210);

  Listen to and alleviate fears and anxieties where possible;

  Offer emotional support;

Provide adequate explanations of programmes, activities and procedures that involve the patient.

- Counselling.
- Comprehensive neuropsychological assessment (Long, et al., 1984).
- Cognitive remediation (Ranseen, 1985).
- Individual psychotherapy (Levin, et al., 1982) three to five times per week (Prigatano, et al., 1984).
- Group psychotherapy.
- Behaviour modification.
- Improve body image, self-concept, feeling of worth, self-confidence and self-esteem.
- Speech therapy.
- Remedial reading, writing and arithmetic.

Techniques for improving memory include:

- Effective interpersonal relationships and communication.
- Expect that the patient has learning potential.
- Incorporate all five senses.
- Base the level of information on the patient's background.
- Make the information to be learned meaningful:
  - Show how teaching/learning relates to the life situation.
  - Combine demonstration and explanation.
  - Allow time for response.
- Proceed from the simple to the complex.
- Present the information in small logical steps.
- Introduce graded series of perceptual motor tasks.
- Teach components separately rather than collectively.
- Use overlearning in the past to benefit the patient's present situation.
- Provide repetition and rehearsal:
  - Clear instructions.
  - Daily routine.
  - Frequent practise.
- Use cues and memory aids:
  - Schedule of daily activities.
  - Clocks, calendars and cards.
  - Printed checklists or tape recording of steps for common activities.
- Provide positive feedback:
  - Set short term goals.
  - Positive re-inforcement and/or reward system.

Provide rewards for concentration. Mayo (1978) states that therapists must give more attention to achievement than to the need for assistance. Utilize Skinner's operant conditioning involving praise, privileges, encouragement and re-inforcement.

End each session on a successful note.

Recognise achievement.

- Use games requiring short periods of mental awareness and concentration.
- The potential role of neuropharmacological agents and electronic devices to improve memory warrant further study.

(Mahoney, 1980; Evans, 1981; Levin, et al., 1982).

(ix) Maximise education and training (Jellinek & Harvey,1982).

Education is important for the future independence of the handicapped person (Tumin, 1981). According to Jennett (1983), a head injury may affect the education and career choice of an individual and may mean a lifetime of disability; therefore preventive rehabilitation and prevention of secondary brain damage to maximise recovery is imperative.

Since rehabilitation is essentially teaching, education and learning, the brain injured person in order to make use of a rehabilitation programme, must have some communication skills (not necessarily verbal) as well as an ability to learn new tasks. As perception, memory, speech and motor ability affect learning, the capability of the person to learn is qualified by the extent of the brain injury (Mahoney, 1980). The Adult Development Centre may be utilized to maximise education (Cole, et al., 1985). In rehabilitation planned teaching is essential (Giese & Davis, 1981). The educational needs of the patient, the patient's educational ability and the course to be undertaken should be evaluated in order to establish an educational plan (Edmonds-Hill, 1977; Blyth, 1981). Courses may be undertaken at normal educational institutions or special centres. Should the patient not be capable of further formal education, facilities such as day-centres, adult training centres and workshops must be available (Tumin, 1981).

Educational strategies include:

- The introduction of the clinical nurse specialist/liaison nurse to teach, plan and evaluate patient education (Edmonds-Hill, 1977).
- Educational therapists should be available to assess and treat those patients with severe intellectual deficits.
- Teaching strategies, using special approaches to facilitate learning, must be adapted to the alteration in cognitive functioning that accompanies head injury (Mahoney, 1980).

- The availability of educational facilities:
  Classrooms, equipment and resources.
  Facilities for self-study and programmed learning must be available.
  Teaching may be done on a one to one basis or in group work (Evans, 1981).
- Memory and perception training is an important aspect of education.
- The use of teaching manuals and visual aids to teach patients and families (Edmonds-Hill, 1977).

(x) Maximise vocational training.

The first goal of the treatment programme is to help the patient develop skills that are indirectly related to holding a job (Levin, et al., 1982). The patient must be aware of the true diagnosis in order to accept the social and occupational limitations (Trethowan, 1970).

There should be a vocational rehabilitation service. According to Lowenstein's programme, vocational rehabilitation commences with the assignment of the patient to a workshop (Levin, et al., 1982: 210). Vocational resettlement is the responsibility of the resettlement officer (Nichols, 1980), social worker and occupational therapist. The rehabilitation liaison officer arranges for employment and re-introduces the patient to the natural work environment gradually (Ozga, 1978). According to Nichols (1975), expectations of the vocational staff may lead to commensurate performance by clients.

In order to ensure adequate job placement, the following principles must be applied in the vocational rehabilitation programme (Levin, et al., 1982):

- Early contact and assessment of the patient is imperative.
- Cognitive skills must be improved.
- Esteem as well as independence must be increased.
- Early job assessment is essential.
- Early contact with the employer must be established.
  According to Tumin (1981), handicapped people face discrimination from employers. They can cope in the work situation provided there is adequate support and access and use is made of the correct aids to independence.
- Correct placement of the patient, at the appropriate time in the rehabilitation programme, is essential.
- Use a system of token rewards to stimulate production and promote appropriate behaviour.
- The following vocational facilities must be available:
  Vocational assessment centres.
  Rehabilitation workshops.

An industrial scheme officer ensures steady flow of work (Ministry of Health, 1958). Simple hospital jobs may be allocated.

Industrial work centres (Campbell & Dillon, 1982).

Sheltered (Protected) workshops (Mayo, 1978).

According to De Villiers (1981: 848), "The opportunities for disabled workers are limited in this country." (S.A.)

(xi) Maximise social integration.

Rehabilitation is a behavioural process concerned with behaviour, social and economic recovery. Physical, psychosocial, emotional and economic factors affect resettlement. Planned resettlement of the patient in the most appropriate situation must start as soon as definitive treatment is underway. The aim is to return the patient to his/her previous way of life and work (Nichols, 1980). The Centre for Living, through a series of organised programmes, assists the patient with re-integration into the family, community and job situation (Epperson - Sebour & Rifkin, 1985). According to Edmonds-Hill (1977), a re-socialisation programme helps the disabled person to gain confidence and security. The patient must be re-integrated into the family and community with great care. Bond (Symposium on head injuries, 1977) states that after head injury the disruption of the family is greatest where there is a personality change, aggression, disinhibition, urinary incontinence and gross physical over-activity.

Jennett, et al. (1981) add that it is important for the therapists to realise that many people, prior to head injury, were maladjusted; therefore the socially deviant behaviour may not always be ascribed to the brain damage.

Techniques for achieving social integration include:

- Positive re-inforcement.

  Use a system of token economy for re-inforcement of behaviour (Eames & Wood, 1985b).
- Behaviour modification.
- Individual/Group therapy involving the patient and family.
- Support group for the patient and family.
- Prior to full integration the re-introduction of the patient to the home environment may be done on a day, week-end or half-week basis (Jennett, 1979; Jacus, 1981).
- Day programmes should be established so that the patient can maintain ties with the family, home and community (Bisdee & Hipkens, 1981). Wright (Hirschberg, et al., 1976: 46) adds that generally the public has a negative attitude to the disabled.

- House/Ward duties should be allocated.
- Remedial gymnastics/Physiotherapy.
- Recreation and hobbies (Tumin, 1981).
- Sport.
- The introduction of a walk-a-day club (Allen & Moschak, 1981).

Scheduling the programme

According to Hirschberg, et al. (1976), scheduling of the programme to avoid confusion and exhaustion of the patient is important. The programme, detailing the amount of time to be spent in each department, must be discussed by a multidisciplinary team (Evans, 1981). According to Nichols (1980), short intensive periods of therapy have more effect than prolonged intermittent attendance. A daily schedule, that can be adjusted weekly, according to the patient's needs must be established. The schedule of activities must combine basic maintenance and rehabilitation and must be interspersed with a special exercise and training programme. Included in the schedule there should be times reserved for:

Rest and sleep.

Maintenance of vital functions.

Diagnostic and therapeutic measures:

Prescribed exercises must be completed frequently and long enough to achieve quick results.

Self-care activities:

Toilet training, bathing and hygiene.

Food intake.

Activities of daily living.

One period for recreation.

One free period.

Therapy should be biased to the practical and pragmatic. Where ever possible all tasks within the therapy sessions must be integrated (Hirschberg, et al., 1976).

c. Discharge planning

Discharge planning is considered part of the rehabilitation programme and is interwoven with psychological support and counselling. According to Hirschberg, et al. (1976), discharge planning starts immediately after the initial evaluation. At the

original evaluation an approximate time of discharge must be determined. Discharge planning continues throughout the patient's rehabilitation and terminates with the discharge of the patient who has achieved maximum hospital benefit and may go home or to another facility. In general, the time for discharge is when the patient needs no assistance with vital functions and has become independent in activities of daily living. It is not always possible to meet these two factors prior to discharge from the rehabilitation facility. When discharging a patient, it is important to introduce him/her to the new setting gradually (Bisdee & Hipkens 1981). Once discharge planning is completed a discharge conference must be held to discuss the plan with the patient, family and attending therapists. Early discharge planning achieves efficiency of bed usage (Edmonds-Hill 1977).

d. Follow-up care

Follow-up care as well as regularly scheduled out-patient or home visits are essential:

(i) To ascertain whether the patient maintains the abilities.
(ii) To assist the patient with any physical, psychological or social problems.
(iii) To ensure continued use of appliances.
(iv) To ensure non-interference in self-care activities.
(v) To assess the level of independence of the patient.
(vi) To evaluate the level of rehabilitation achieved.
(vii) To assist with crisis management.
(viii) For the purpose of evaluation.

The weakest link in most rehabilitation programmes is follow-up care. Failure in this respect is responsible for much regression and development of preventable disability. Mailed questionnaires may be utilized to assist with effective follow-up care in out-patient departments (Davis & Jellinek, 1982). According to Nichols (1975), when evaluating the effect of rehabilitation one must consider the clinical, behavioural and psychological response.

"The ultimate test of a rehabilitation endeavour is the demonstrated ability of the individual to maintain what he has achieved and to use his potential capacities effectively for the duration of his life." (Hirschberg, et al., 1976: 185)

9.3.2 DOCUMENTATION

Accurate documentation is essential to record responses, progress of the patient, to allow for adjustment of the programme, for patient follow-up and programme

evaluation (Hirschberg, et al., 1976). Edmonds-Hill (1977) suggests that documentation should be by means of standardised nursing care plans. The problem-orientated record may be used as a means of maintaining the continuity of care, for recording and evaluating the quality of care. Whereas Quigley (1981) suggests the use of the rehabilitation patient progress note as a means of documentation. Hirschberg, et al. (1976) suggest the use of graphic charts to record information such as activity, activities of daily living, mobility, muscle strength and treatment.

9.4 FACILITIES FOR THE REHABILITATION OF HEAD INJURED PATIENTS (Vide p87)

9.4.1 REHABILITATION MAY BE CARRIED OUT IN ONE OF FOUR PLACES (Hirschberg, et al., 1976)

a. MEDICAL OR SURGICAL WARD

According to Tobis, et al. (1982), the rehabilitation programme should be part of the acute hospital where all services are available. Cole, et al. (1985) state that the daily cost of an acute hospital based rehabilitation programme is $500.00. No local figures are available.

b. CONVALESCENT HOSPITALS

(i) **Nursing homes** (Hirschberg, et al., 1976).

(ii) **Young chronic sick units** (Lewin, 1970; Clarke, 1977).

Anwar (1979) states that after the acute phase there is a lack of special centres required for the care of the head injured patient and therefore the patient may be placed in other centres such as a geriatric unit or units for the chronically sick. Lewin (1970) states that ordinary convalescent units are not satisfactory facilities for rehabilitation as they do not provide suitable stimuli and that there are gaps in the health services between the acute stage and the industrial rehabilitation unit.

c. HOME CARE (Gersten, et al., 1968; Hirschberg, et al., 1976)

The aim of rehabilitation is independent living and this can best be carried out at home. Glanville (n.d.) suggests the need for a mobile rehabilitation facility. Multidisciplinary domiciliary rehabilitation services are advocated by Clarke (1977).

d. REHABILITATION FACILITIES (Hirschberg, et al., 1976)

If patients are to benefit to the fullest extent ordered planning and organisation of the use of the hospital's rehabilitation facilities is essential (Ministry of Health, 1958: 1). Bisdee and Hipkens (1981) state that a difference exists in the environment of a rehabilitation hospital and an acute care setting. The environment of the rehabilitation hospital must be conducive to rehabilitation rather than to the formality of the acute care setting. According to Edmonds-Hill (1977), one cannot mix acute care patients and rehabilitation patients in the same setting as the acute cases take priority. Jennett (1983) adds that difficulties arise in general rehabilitation facilities when patients exhibit emotional and personality problems, have difficulty in communicating or have epilepsy. Nichols (1975) states that a rehabilitation centre is a therapeutic community where the patients are able to re-establish self-esteem in the face of severe disability.

According to Nichols (1980), the rehabilitation centre should:

- Provide co-ordinated facilities.
- Co-ordinate and correlate all services with available government, private and voluntary community rehabilitation services.
- Be an advisory service in problems of rehabilitation and resettlement.
- Direct referrals, in particular clinical and work referrals.
- Provide teaching and research into rehabilitation.

(i) In-patient rehabilitation service

An in-patient rehabilitation service is defined as a separate unit, specifically dedicated and designed for the rehabilitation of severely disabled patients. Therefore, if the patient requires intensive rehabilitation, he must be placed in such a rehabilitation centre (Ranseen, 1985). The results of Tobis, et al. (1982) show that early rehabilitative intervention is medically and therapeutically desirable.

The in-patient rehabilitation centre is directed by a physician, consultant or physiatrist (Nichols, 1980; Tobis, et al., 1982) and may treat multiple or selective disabilities. Nichols (1980) suggests that special head injury rehabilitation centres be organised on a regional basis. Lewin (1970) suggests that there should be a special unit for the rehabilitation of head injured patients as their needs and the tempo of the unit are different to that of a general rehabilitation unit. Failing this, a special area within the general unit must be designated for these patients. Although Evans (1981) suggests that a mixed centre, rather than one which specialises in caring for one particular

handicap, probably provides the most effective rehabilitation. The rehabilitation service may be established in a general hospital complex, or as a separate facility. Wherever it is established, there must be an affiliation to a hospital with therapeutic, diagnostic, medical, neurological and psychiatric services (Lewin, 1970). Clarke (1977) suggests that the rehabilitation unit should simulate a house although full integration may not be possible.

(ii) Out-patient rehabilitation

Most rehabilitation centres have out-patient and follow-up care for patients who have been rehabilitated. This allows the patient to live at home or in a facility nearby and be transported to the out-patient facility for rehabilitative care. Many hospitals that do not have in-patient rehabilitation services have out-patient rehabilitation facilities. Independent out-patient facilities do exist.

(iii) Vocational rehabilitation facilities

The Adult Development Center as suggested by Cole, et al. (1985) maximises work and study habits, cognitive and academic skills, social and behavioural awareness and bridges the gap between the acute care setting and final work or academic placement. As work is important in society, plans must be made for vocational rehabilitation (Ozga, 1978). According to Clarke (1977), progressive rehabilitation necessitates the establishment of:

Protected workshops (Lewin, 1970; Mayo, 1978).

Industrial work centres (Campbell & Dillon, 1982)

Lewin (1970) states that it is important not to send the patient to an industrial centre too early.

Epperson-Sebour and Rifkin (1985) suggest that the current trend in management is toward a continuum of care with treatment starting at the scene of the accident, continuing through acute medical and rehabilitation settings and concluding in a community based programme.

9.4.2 DESIGNING REHABILITATION FACILITIES

Considerable time and resources are spent in establishing rehabilitation facilities. The function of the architect is to design a rehabilitation facility that meets the statutory,

professional, ethical, aesthetic and individual requirements of such an institution (Lewin, 1970; Hirschberg, et al., 1976; Clarke, 1977; Nichols, 1980).

9.4.3 STAFFING FOR REHABILITATION SERVICES

According to Hirschberg, et al. (1976), Eames and Wood (1985) and the researcher, one of the most important factors in the successful rehabilitation of the disabled is the staff. Personnel involved in rehabilitation must believe in human value, maintain high ethical beliefs and have a zeal for social benefit.

a. The rehabilitation setting requires both administrative and clinical staff (vide p18). The administration is responsible for providing adequate staffing for the rehabilitation centre, directing and maintaining services. Without the support of administrative staff the clinical staff cannot function nor can the programme be effective. Functions of the clinical staff include:

(i) To provide direct care throughout the patient's programme.
(ii) To provide medical care.
(iii) Restoration to activities of daily living.
(iv) Psychosocial services.
(v) To provide consultant aid to diagnose, solve and treat short term problems.

According to Hirschberg, et al. (1976), rehabilitation can be carried out anywhere, provided an adequate number of knowledgeable personnel are available. As rehabilitation commences as soon after injury as possible staffing of all care areas in order to provide comprehensive quality care to the patient must be considered.

b. The nursing staff establishment in the rehabilitation setting may vary to include:

(i) Rehabilitation nurses (Brunner & Suddarth, 1974).
(ii) Neurosurgical nurse practitioners (Rimel & Langfitt, 1980).
(iii) Rehabilitation clinical nurse specialists (Edmonds-Hill, 1977; Williamson-Kirkland & Berni, 1980; Giese & Davis, 1981).
(iv) Rehabilitation nurse liaison officers (Simmon, 1977; Ozga, 1978).

For detail regarding the role of the nurse in the rehabilitation setting vide p52.

The detailed review of the literature is necessary as the scope of practice of the nurse includes dependent, independent and interdependent functions. The presentation is an overview of current health practice that will aid the nurse in the understanding of the overall management of the head injured patient. It is an opportunity for the nurse to gain insight into medical and nursing management of the head injured patient, to establish fundamental principles, as a basis of knowledge that can be incorporated in a quality assurance programme for the head injured

patient. Comprehensive co-ordinated care of the head injured patient necessitates knowledge in relation to associated injuries and the sequalae of brain trauma. The section dealing with the management of the patient and rehabilitation is vast. This is intentional as there is a certain amount of cross referencing in Chapter 9 when discussing recommendations in this regard (vide p406).

CHAPTER 4

RESEARCH METHODS

1. INTRODUCTION

The purpose of the study was to investigate the comprehensive care of the moderate and severely head injured patient extending from the time of injury, until ultimate recovery with a view to preventive and curative rehabilitation.

The following aspects of the comprehensive care of the moderate and severely head injured patient have been investigated:

1. Comprehensive facilities and resources for the care of the head injured patient, internationally and nationally.
2. The epidemiology of head injuries.
3. Recovery after head injury.
4. Quality assurance.

   A module for assessing the quality of comprehensive care of head injured patients.

4.1 Staffing for quality care.

4.2 Staff knowledge.

For this essentially descriptive study of ordinal data a non-experimental research design was employed. In order to elicit the information required, the operationalization of variables involved many research techniques.

TABLE 4:1

Summary of the research methodologies and means of data analysis utilized

Aspect of comprehensive care	Research design	Research instrument	Discussion (vide)	APPENDIX	Data analysis
Head injury facilities	Visit to facilities Head injury facilities Rehabilitation facilities	Observation Questionnaire Questionnaire (2)		C2 C3 C4/5	Manual Manual Manual
Epidemiology	Epidemiological study	Retrospective audit by means of a survey		D	Manual
Patient status	Patient assessment: Day of admission Day of observation Patient dependency rating Assessment of pre-injury status and family knowledge Post-injury assessment Assessment of present status of patient	Retrospective audit Concurrent audit Data sheet Interview/Questionnaire Telephonic interview Part I - Questionnaire Part II - Checklist Visit/observation/consultation Data sheet		E1 E2 E3 E6 E9 E10 E12	Computer Computer Computer Manual Manual Manual Manual
Quality assurance study	Situational analysis: Staffing Bed occupancy Overall patient dependency Evaluating the care received by patient: Prescription of care Frequency of care Extent of care Norm of care Weighted norm of care Standards of practice Patient care standards Quality assurance module Knowledge assessment: Nursing personnel Medical/paramedical personnel Education of Student Nurses	Concurrent audit Non-participant observation Data sheet Data sheet Data sheet Data sheet Checklist (Schedule) Checklist (Schedule) Checklist (Schedule) Data sheet Data sheet Request for comment Questionnaire Questionnaire Questionnaire		F1 F2 G G I I I J K O/P Q1 Q2 Q5	Computer Computer Computer Computer Computer Computer Computer Computer Computer Manual Computer Computer Manual

DATA COLLECTION

The methods employed to collect data for the various aspects of the study are stated according to the research design (vide p112).

Personnel involved in data collection included:

1. Research assistants.

Funding for research assistants was not available. The research assistants, except for one (secretarial), were voluntary registered nurses. (One retired registered nurse assisted throughout the study. Nine post-basic nursing students of the Department of Nursing Education, University of the Witwatersrand, assisted part-time for four weeks only.)

Data collected by research assistants included:

(i) Retrospective review of the 'Patient Admission Register' for the epidemiological survey (Students).

(ii) The issuing and collecting of educational questionnaires (Students).

(iii) The issuing of questionnaires relating to head injury facilities (Retired Registered Nurse).

(iv) The tracing of cases for post-injury follow-up (Retired Registered Nurse).

2. The researcher.

All other aspects of the research were undertaken by the researcher personally.

DATA ANALYSIS

Data analysis was done by means of:

A computer.

Manual sorting.

As computer analysis was extremely costly and funding was not available, manual sorting of data was undertaken where possible.

DATA STORAGE

All data is strictly confidential and was stored in the computer and patient files that were under lock and key. The only people with access to the data were the researcher, computer programmer and statistician.

2. GAINING ACCESS TO THE RESEARCH SITE/S

Prior to commencing the proposed research project it was necessary to gain access to the research site/s (APPENDIX A) by means of letters, interviews, formal meetings and discussions with individuals and groups (APPENDIX B1, B2, B3).

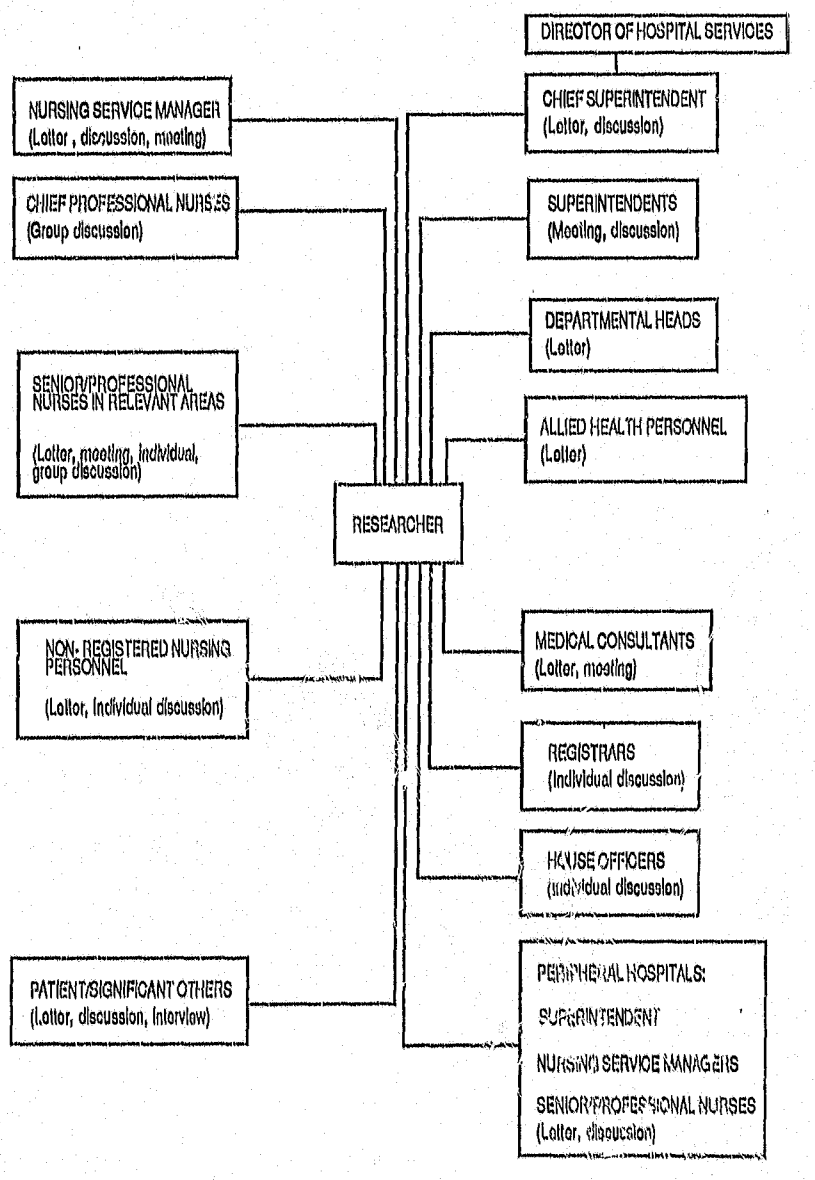

Fig. 4:1 Gaining access to the research site/s

3. EVALUATION OF FACILITIES FOR THE COMPREHENSIVE CARE AND REHABILITATION OF HEAD INJURED PATIENTS

3.1 LEGISLATION CONCERNING THE COMPREHENSIVE CARE OF HEAD INJURED PATIENTS

PURPOSE

The information requested from policy making insitutions and/or authorities was needed to establish:

Who is responsible for rehabilitation in South Africa.

The specific legislation relating to the comprehensive care and rehabilitation of head injured patients.

The availability of specific facilities for the rehabilitation of the head injured patient.

RESEARCH TECHNIQUE

Letter (APPENDIX C1.1, C1.2).

3.2 VISITS TO SPECIAL CENTRES

Visits to head injury units and rehabilitation facilities, internationally and nationally, were undertaken in 1979 - 1982 and 1983 - 1985 respectively (APPENDIX C2). Other centres were consulted by correspondence (vide p116).

PURPOSE OF THE VISITS

To assess:

The facilities available for the comprehensive care and rehabilitation of head injured patients.

The resources available for comprehensive care.

The comprehensive management of head injured patients.

RESEARCH TECHNIQUE

Observation

TABLE 4:2

Name and location of institutions visited

International visits (7)	National visits (4)
Addenbrookes Hospital, Cambridge, United Kingdom. (1979/1982)	Avalon Rehabilitation Centre, Johannesburg, South Africa. (1984)
Birmingham Accidont Hospital, Birmingham, United Kingdom. (1979/1982)	Edenvale Hospital, Johannesburg, South Africa. (1984)
Midland Centre for Neurosurgery and Neurology, Birmingham, United Kingdom. (1979)	Military Hospital, Voortrekkerhoogte, Pretoria, South Africa. (1984)
Western General Hospital, Edinburgh, Scotland. (1979)	The Johannesburg Hospital, Johannesburg, South Africa. (1985)
Institute of Neurological Sciences, Glasgow, Scotland. (1982)	
Rivermead Rehabilitation Centre, Oxford United Kingdom. (1982)	
Wolfson Rehabilitation Centre, Wimbledon, United Kingdom. (1982)	

3.3 THE ASSESSMENT OF HEAD INJURY FACILITIES

PURPOSE

To assess:
The availability of care and rehabilitation facilities.
Staff establishment for the units.
Patient management.
Discharge planning.
Financial implications.

RESEARCH TECHNIQUE

Mailed questionnaires.
In view of the distribution and distance of respondents the questionnaire technique was used to obtain data. Interviews were undertaken where permission to submit the questionnaire to local hospitals could not be obtained or respondents did not agree to completing the questionnaire.

INSTRUMENT DESIGN

Three questionnaires were compiled:

QUESTIONNAIRE I - HEAD INJURY UNIT (APPENDIX C3)
QUESTIONNAIRE IIA - COMPREHENSIVE REHABILITATION FACILITY AVAILABLE (APPENDIX C4)
QUESTIONNAIRE IIB - NO COMPREHENSIVE REHABILITATION FACILITY AVAILABLE (APPENDIX C5)

The questionnaires were multidisciplinary. Therefore, for completion, the co-operation of the medical, allied health personnel and nursing services was needed. All questions included in the questionnaire pertained to the facilities, available resources, care and rehabilitation of the head injured patient.

As the design and structure of the three questionnaires is similar they are presented concurrently. TABLE 4:3 must be read in conjunction with APPENDIX C3, C4, C5. All items are self-explanatory.

TABLE 4:3

The design and structure of the questionnaires relating to the HEAD INJURY UNIT (I) and REHABILITATION FACILITIES (IIA/B)

Questionnaire number	I	IIA	IIB
Heading	HEAD INJURY UNIT	COMPREHENSIVE REHABILITATION FACILITY	NO COMPREHENSIVE REHABILITATION FACILITY
Question sequence	Question number	Question number	Question number
Structure of unit/facility	1	1	1-3
Bed occupancy	2	2	N/A
Staffing	3	3	4-5
Unit teaching	4	4	N/A
Patient management	5	5-6	6-9
Family involvement	6	7	N/A
Discharge of patient	7	8	10
Financial implications	8	9	-
Miscellaneous	9	10	11-12
Total number of questions	49	59	12

INSTITUTIONS SAMPLED

Selection of sample

Names and addresses of institutions concerned with the care and rehabilitation of head injured persons were obtained by the following means:

a. International facilities:

(i) By reviewing journal articles and books concerning head injuries.

(ii) From the American (Pekkanen, 1979; Thomas & Ruffner, 1982) and British Consulates in Johannesburg, South Africa.

(iii) From personal contacts with nursing and neurosurgical colleagues.

b. South African facilities:

Private and provincial institutions, locally and nationally, cited in the Hospital Year Book (Engelhardt, (ed.) 1984), concerned with medical and/or surgical patients and rehabilitation.

Size of sample

TABLE 4:4

The number of institutions who received questionnaires

Country	Questionnaire		
	I	IIA	IIB
South Africa	25	25	25
United Kingdom	15	15	5
United States of America	10	10	10
TOTAL	50	50	40

The number of questionnaires issued to each institution included in the sample varied.

a. International facilities.

All facilities selected for inclusion in the study had either/or both head injury units and rehabilitation centres, therefore each facility received one or two questionnaires. QUESTIONNAIRE IIB was submitted to those institutions that were known to have head injury units but no rehabilitation facilities.

b. South African facilities.

As details relating to the existence of specific head injured facilities were unobtainable, all three questionnaires were issued to each institution.

DISTRIBUTION OF QUESTIONNAIRES

Questionnaires were mailed to all respondents. A covering letter accompanied the questionnaires (APPENDIX C6, C7, C8). International currency regulations prohibited stamped self-addressed envelopes from being enclosed, but the researcher stated that on notification any costs incurred would be re-imbursed.

4. THE SURVEY OF EPIDEMIOLOGICAL DATA

PURPOSE

To assess the epidemiology of all head injured patients admitted to the trauma unit of The Hospital (APPENDIX A).

TIME SPAN

The survey was conducted over a period of 18 months (November, 1982 - April, 1984).

PATIENT POPULATION

All patients admitted to the trauma unit of The Hospital during this period.

RESEARCH TECHNIQUE

Retrospective audit of the 'Patient Admission Register' and patient microfiches by means of a survey (APPENDIX D). The information audited and recorded included: (Read in conjunction with APPENDIX D).

1. The total number of patients admitted to the trauma unit, per month.
2. The total number of head injured patients admitted to the trauma unit, per month.
3. Patient details.
4. Admission details.
5. Medical diagnosis/diagnoses.
6. Mechanism of injury.
7. The consumption of alcohol.
8. Details of discharge/transfer, etc.
9. Length of stay in hospital.

DESCRIPTION OF TERMS SPECIFIC TO THIS STUDY

TABLE 4:5

Mechanism of head injury

Term	Meaning
MVA	Motorvehicle accident.
MBA	Motorcycle accident.
PVA	Pedestrian vehicle accident.
B	Bicycle accident.
Assault	Injury as a result of interpersonal violence.
Fall	Any accident as a result of slipping, jumping, or falling.
Gunshot	Ammunition injury (whether of an intentional or accidental nature).
Sport	Injury caused by sports activities.
Other	Any cause of injury not previously stated.
Not recorded	No cause of injury stated either in the admission record or patient microfiche.

TABLE 4:6

Severity of injury

Severity category		Definition
Minor injury	Concussion	Concussion. Transient loss of consciousness of ≤2 mins. Glasgow Coma Scale score 13-14/15. Where both concussion and laceration are present the patient is classified as "Concussion".
	Laceration of scalp	Laceration of scalp, excluding facial lacerations. No associated concussion.
More severe injury	Intracranial blood	Suspected or confirmed intracranial bleeding irrespective of the presence of a fracture or generalised head injury.
	General head injury	A general head injury, cerebral oedema, excluding the presence of a blood or fracture.
	Fractured base of skull	Presence of a fractured base of skull.
	Fracture of vault	Presence of a fracture of the vault.
	Other	Presence of concussion and signs of a neurological loss or seizure activity.

TABLE 4:7

Outcome after head injury

Outcome category		Definition
Refused hospital treatment (RHT)		Patient who signs own discharge, without the consent of the physician-in-charge.
Direct discharge		Patient discharged to home and/or care of significant others.
Transfer	Intrahospital	Transferred to another ward within The Hospital.
	Interhospital	Transferred to another hospital.
	Peripheral unit	Transferred to a peripheral hospital that has a rehabilitation facility.
Organ donor		Head injured patient certified as brain dead on or after admission. Time of death as recorded in operating theatre.
Death		Head injured patient who dies and whose organs are not donated.
Not stated		No data available.

5. THE SELECTION OF THE PATIENT GROUP FOR INCLUSION IN THE SECTION OF THE STUDY CONCERNED WITH PATIENT RECOVERY AND THE QUALITY OF CARE RECEIVED BY THE MODERATE AND SEVERELY HEAD INJURED PATIENT

As a result of the extensive provincial, private and government health services in South Africa not all head injured patients in the vicinity were admitted to The Hospital. Thus the findings are not representative of the total head injury population but of the head injured patients admitted to the trauma unit of The Hospital.

There is no specific head injury unit at The Hospital. The practice is that head injured patients are admitted to either of two units:

1. The trauma unit under the care of the general surgeons. Neurosurgical consultation is available on request.
2. The surgical intensive care unit.

The one is a trauma unit (general surgical unit) and the other an intensive care unit. The staff establishment of the two units varied considerably, therefore it was not

feasible to compare the two units. In an endeavour to obtain a measure of consistency and to reduce variables, only patients admitted to the trauma unit of The Hospital were included in the study.

5.1 CRITERIA FOR SELECTION OF PATIENTS

5.1.1 Inclusion criteria

a. The patient's medical diagnosis must be documented as moderate or severe head injury (whether in words or using the Glasgow Coma Scale (G.C.S.)).

b. A G.C.S. score on admission:
9 - 12/15(moderate head injury);
≤8/15 (severe head injury).

c. A loss of consciousness since time of accident:
≥ twenty minutes (moderate head injury);
≥ six hours (severe head injury).

d. The patient had to be admitted directly or as a hospital transfer to the trauma unit at any stage after injury.

e. The age range for inclusion in the study was 13 - 55 years. As the rehabilitation process for the ages selected is similar it was unnecessary to exclude patients of 13 years.

f. Associated injuries, except as stated below were not a reason for excluding patients. Where no neurological loss occurred as a result of a spinal injury the patient was included.

5.1.2 Exclusion criteria

a. Patients over 55 years. Re-organisation and re-education after head injury in patients older than 55 years is frequently inhibited by other factors therefore these patients were excluded.

b. Self-inflicted gun shot wounds.

c. Multiple central nervous system injury where neurological deficit occurred as a result of a spinal injury.

d. Associated injury such as traumatic amputation of a limb or a brachial palsy injury that may affect rehabilitation.

e. Any pre-existing disease such as existing carcinoma, grade four chronic obstructive pulmonary disease and diabetes mellitus that may preclude, hamper, or affect the rehabilitation process.

f. Drug and/or alcohol dependence.

g. A stay in the unit of ≤ 12 hours.

5.2 SIZE OF THE PATIENT GROUP

A review of the 'Patient Admission Register' over a period of six months prior to commencing the epidemiological survey in November, 1982 revealed the following:
± 40 head injured patients were admitted per month:
Eight severe head injuries;
Six moderate head injuries;
26 minor head injuries.

Therefore, over a period of twelve months ± 168 more severe head injured patients would be admitted. In a six month period 84 patients would be admitted. With exclusion criteria the researcher believed it would be possible to conduct the research over a period of six months. Because of the nature of the study 20 cases, over a six months period i.e. 23.81 percent would be selected for the study.

After the epidemiological survey from November, 1982 - October, 1983 the researcher reconsidered the size of the sample in order to base the size of the sample on the number of head injured patients admitted to the unit during this period.

Calculation of the size of the sample

TABLE 4:8

Average number of head injured patients admitted to the trauma unit (November, 1982 - October, 1983)

Time period	No. of head injured cases
Admitted over a 12 month period	**420**
Suffering from:	
Minor head injury	180
More severe head injury	240
Admitted over a six month period	**210**
Suffering from:	
Minor head injury	90
More severe head injury	120
Admitted per month	**35**
Suffering from:	
Minor head injury	15
More severe head injury	20

The use of the documented epidemiological data to decide on the number of cases to be included in the study proved difficult. Those with a G.S.C. score of > 12/15 irrespective of the associated head injury who were classified in the category 'more severe head injury' (vide p120) did not meet the inclusion criteria.

In terms of the epidemiological findings 20 cases represents one sixth (16.67 percent) of the total number of cases with more severe head injuries admitted over a six month period. Therefore as sample size must be equal to, or more than 10 percent of the population, the size of the sample remained us 20 cases. 20 cases over a period of six months was regarded by the statistician as an adequate sample. The researcher being guilty of oversampling rather than undersampling.

5.3 SAMPLING TECHNIQUE

Consecutive sampling, until such time as 20 cases had been selected was to be used. The patients selected retained the same case number throughout the study.

5.4 TIME SPAN OF THE STUDY

The quality assurance study was conducted over a period of six months, commencing on the 1st November, 1983. The first patient was selected on the 2nd November, 1983 and the last on the 26th April, 1984. Thereafter each patient was followed up for two years after injury.

6. RESEARCH METHODOLOGIES EMPLOYED TO GATHER INFORMATION PERTAINING TO THE PATIENTS INCLUDED IN THE STUDY

6.1 ASSESSMENT OF PATIENT - DAY OF ADMISSION

PURPOSE

Information regarding the patient's status on admission was required:
To obtain a comprehensive overview of the patients condition on admission.
To describe the management of the head injured patient on admission.
For comparative purposes.

RESEARCH TECHNIQUE

Retrospective review of the medical and nursing records was used to obtain as complete an assessment as possible (APPENDIX E1).

INSTRUMENT DESIGN

The data sheet is a descriptive tool designed to record all information relevant to the status of the patient, after the injury. Data recorded:

1. The extent of the head injury.
2. The Glasgow Coma Scale score after injury.
3. The general condition of the patient.
4. The presence of associated injuries.
5. The patient's management and rehabilitation programme.

The data sheet contains 29 items to be noted.

TABLE 4:9

The design of the data sheet:
Assessment of patient - Day of admission

Item number	Information recorded
First page	Identifying data.
1	Diagnosis.
2 - 7	History of injury.
8	Vital signs.
9 - 16	Neurological status.
17	Associated injuries.
18	Previous history.
19	Resuscitation.
20	Management.

6.2 ASSESSMENT OF PATIENT - DAY OF OBSERVATION

PURPOSE

Information regarding the status of the patient on the day of observation was required:
To obtain a comprehensive overview of the patient's condition on the day of observation.

To describe the management of the head injured patient.
To calculate the patient dependency rating (vide p127).
To establish patient care standards for the individual patient (vide p155).
For comparative purposes.

RESEARCH TECHNIQUE

Concurrent chart review.
Non-participant observation.

INSTRUMENT DESIGN

The data sheet is a descriptive tool and contains 36 items relating to the management, current physical and psychological status of the patient on the day of observation (APPENDIX E2).

TABLE 4:10

The design of the data sheet:
Assessment of patient - Day of observation

Item number	Information recorded
First page	Identifying data.
1	Time post injury.
2 - 3	Patient environment.
4 - 9	Neurological status.
	Aspects of patient management:
10	Airway.
11	Sedation.
12 - 14	Fluid balance, nutrition and elimination.
15	Integumentary system.
16	Mobility.
17	Use of restrainers.
18	Permissible stimulation.

6.3 PATIENT DEPENDENCY RATING

PURPOSE OF CALCULATING THE INDIVIDUAL PATIENT DEPENDENCY RATING

To assess patient status, progress and needs.

To establish patient care standards.

INSTRUMENT DESIGN

The individual patient dependency rating (APPENDIX E3.1, E3.2) applies to the 20 patients selected for inclusion in the study. The patient dependency rating is based on the patient dependency classification suggested by Georgette (1970). There are four patient dependency categories:

I SELF-CARE.

II MINIMAL CARE.

III INTERMEDIATE CARE.

IV MODIFIED INTENSIVE CARE.

This particular classification classifies patients as grades I - IV and has been modified by the researcher for use with head injured patients.

6.4 LETTER OF INTRODUCTION. (APPENDIX E4).

(Vide p180)

6.5 CONSENT FORM. (APPENDIX E5).

As the study included aspects of the comprehensive care of the moderate and severely head injured patient from time of injury until recovery two years after injury, the co-operation of the family and patient throughout the study was needed. Although The Hospital is an academic hospital and all patients admitted may be included in teaching or research, the researcher believed that in a study of this nature where follow-up and consultation was needed, the consent of those involved should be obtained. All families granted permission for the patients to be included in the study.

6.6 ASSESSMENT OF THE PRE-INJURY STATUS OF THE PATIENT AND FAMILY KNOWLEDGE

PURPOSE

To assess the premorbid physical, psychosocial, emotional, spiritual, educational and economic predisposition of the patient.
To establish a baseline patient status for the purpose of monitoring the extent and quality of recovery.

RESEARCH TECHNIQUE

Standardised interview (APPENDIX E6).
To avoid bias and interviewer variability, only after examining the quality of care received by the particular patient the researcher arranged and conducted all interviews.

INSTRUMENT DESIGN

The structured interview schedule served a dual role as:

1. An interview schedule.
2. A mailed questionnaire, if circumstances precluded an interview (APPENDIX E7).

The interview schedule contained both 'open-ended' and 'closed' questions relating specifically to pre-morbid conditions such as physical, psychosocial, emotional, economic and spiritual well-being that may affect the care and recovery of the moderate or severely head injured patient.

The 74 items of the interview schedule are arranged in nine sections (APPENDIX E6). All headings and items are self-explanatory.

TABLE 4:11

The design of the questionnaire: Assessment of the pre-injury status of the patient and family knowledge

Question number	Information requested
First page	Identifying data.
1 - 4	General information.
5	Accident details.
6	Family structure.
7	Home conditions.
8 - 13	Psychosocial factors.
14	Education.
15 - 17	Economic conditions.
18 - 19	Patient/Family information.

6.7 PATIENT RECOVERY

6.7.1 PATIENT RECOVERY RECORD

PURPOSE

The 'Patient Recovery Record' book, hereafter referred to as 'Recovery Record' was compiled to enable the family to record the patient's actions, reactions and responses, at regular intervals, in order to:

Assess the patient's level of functioning, progress and recovery.

Complete the questionnaire issued after 12 months honestly, accurately and completely.

Note any patient problems requiring discussion, intervention or consultation with the researcher.

DESIGN OF THE 'RECOVERY RECORD'

The 'Recovery Record' consisted of a small hard cover exercise book. The outside cover stated the patient's identifying data. The inside cover contained "INSTRUCTIONS FOR COMPLETING THIS RECORD" (APPENDIX E8).

DISTRIBUTION

On completion of the interview the purpose and use of the 'Recovery Record' was explained to the interviewee and the 'Recovery Record' was issued.

6.7.2 POST-INJURY ASSESSMENT OF THE PATIENT

a. POST-INJURY ASSESSMENT

PURPOSE

To compare the patient's pre-injury status and post-injury recovery.
To elicit information regarding the physical, psychological, emotional, social and economic recovery of the patient at three, six and 12 months after injury in order to assess the patient's recovery.
To assess the use of rehabilitation resources throughout recovery.
To examine the role of the multidisciplinary team in the patient's rehabilitation.

RESEARCH TECHNIQUES

The mailed questionnaire consisted of two parts.

PART I - THE QUESTIONNAIRE (APPENDIX E9)

The questionnaire technique was selected as a means of collecting data concerning the recovery of the patient as:

1. The place of residence of the head injured patients included in the study precluded the use of interviews. The furthest patient residing 292 kilometres and the closest 10 kilometres from The Hospital.
2. Detailed information was required therefore sufficient time for completing the questionnaire (eight weeks) had to be allowed.
3. The respondents needed to consult the patient/others in order to complete the questionnaire.

INSTRUMENT DESIGN

The questionnaire was designed in such a way as to be completed by the family in consultation with the patient. Descriptive information regarding the patient's status after injury was required. Both 'open-ended' and 'closed' type questions were asked. 63 questions were arranged in nine sections.

TABLE 4:12

Definition of terms

Term	Meaning
Primary placement	The place to which the patient was discharged or transferred from The Hospital.
Secondary placement	The place to which the patient was discharged from the primary placement.

TABLE 4:13

The design of the questionnaire:
The post-injury assessment of the patient

Question number	Information requested
First page	Identifying data.
1 - 7	Rehabilitative management of patient.
8	Patient response.
9	Motivation and stimulation of patient.
10	Home advice/care.
11 - 13	Attitude/Knowledge.
14-16	Level of functioning.
17	Medications.
18	Future plans.
19	Transport.
20 - 22	Miscellaneous.

All other headings and items are self-explanatory.

PART II - THE CHECKLIST (APPENDIX E10)

PURPOSE

The checklist was used for recording data relevant to the physical, emotional, psychosocial, educational and economic recovery of the moderate and severely head injured patient.

RESEARCH TECHNIQUE

The checklist is a simple, effective method of recording comprehensive detailed data.

INSTRUMENT DESIGN

The checklist contains 147 items arranged in 16 sections. It was devised to assess head injury recovery at three, six and 12 months after injury. The checklist was to be completed by the family in consultation with the patient and/or others.

All instructions, headings and items are self-explanatory.

TABLE 4:14

The design of PART II - THE CHECKLIST

Aspect of recovery	Title on checklist (N=16)	Number of items
Self-care activities	Personal care. Dressing. Feeding.	13 5 9
Independence	Mobility. Communication.	10 12
Psycho-emotional factors	Personality and mood assessment. Family relationships. Sleep.	7 10 4
Cognitive skills	General cognitive skills. Reading. Writing.	12 8 5
Social integration	Social assessment. Home activities. Leisure activities.	7 7 14
Economic assessment	Economic assessment.	9
Occupational assessment	Job/School assessment.	15
TOTAL		147

DISTRIBUTION OF THE QUESTIONNAIRE AND CHECKLIST

Prior to distribution, the families of the 13 patients alive 12 months after injury were contacted telephonically and the purpose of the questionnaire and checklist was explained. A covering letter and stamped self-addressed envelope were included (APPENDIX E11).

CALCULATION OF PATIENT RECOVERY

Patient recovery has been calculated using the responses of the patient/family on the checklist (APPENDIX E10). Because of the nature of the information requested not all items on the checklist could be included when calculating patient recovery.

TABLE 4:15

Items not included in the calculation of patient recovery

Aspect of recovery	Item number	Detail of item
Personal care	6 8	Patient is able to keep himself/herself clean and dry. Patient has a urinary catheter/condom in situ.
Feeding	21 26 27	Patient is able to eat with help of another. Patient has maintained body weight. Patient's eating habits have changed.
Mobility	28 29 32	Patient is confined to bed. Patient is confined to chair. Patient is only able to walk with help of: One person Two people.
Communication	40 49	Patient is able to communicate by signals, signs, writing only. Patient speaks at slow speed.
Personality and mood assessment	55	Patient's personality has changed.
Family relationships	63	More time is spent with the patient since the injury.
General cognitive skills	72 73 75 77 82	Patient's short term memory is affected. Patient's long term memory is affected. Patient has short attention span. Patient has difficulty concentrating. Patient has undergone formal psychological assessment.
Home activities	109	Patient has been formally assessed on activities related to the household.
Leisure activities	111 122 123	Patient gets bored. Patient's favourite programmes. Patient watches TV for .....
Economic assessment	132	What is the monthly income of the patient?
Employment	142 146 147	Patient has undergone formal work/school assessment. Patient's concentration is a problem at job/school. Patient's memory is a problem at job/school.

A total of 122 items are included in the discussion on patient recovery. In order to describe patient recovery as comprehensively as possible, the items relating to the

particular aspects of recovery mentioned on the checklist namely personal care, feeding, dressing, mobility, etc. have been grouped. According to the number of items relating to the specific aspect of recovery, an arbitary scale of 1 → has been used to calculate the percentage of recovery that has taken place at three, six and 12 months after injury. Items not applicable to the particular patient have been excluded from the calculations.

Feeding	3 months after injury		6 months after injury		12 months after injury		Comment
	Yes	No	Yes	No	Yes	No	
19. Patient is motivated to eat.		√	√		√		
20. Patient is able to eat by himself/herself.		√		√	√		
21. Patient is able to eat with help of another.	√		√				
22. Patient holds knife correctly.		√		√	√		
23. Patient holds fork correctly.		√		√	√		
24. Patient holds spoon correctly.		√	√		√		
25. Patient enjoys food.		√		√	√		
26. Patient has maintained body weight.		√		√		√	
27. Patient's eating habits changed.	√		√		√		

Fig 4:2 An example of a completed section of THE CHECKLIST: FEEDING to illustrate the calculation of the percentage recovery of the patient

Total number of items = 9

Total number of items not applicable to calculation = 3 (Items 21, 26, 27)

Number of applicable items = 6

Calculation of percentage recovery up until three months:

$$\frac{\text{SUM OF YES ATTAINED FOR APPLICABLE ITEMS AT THREE MONTHS}}{\text{NUMBER OF APPLICABLE ITEMS}} \times \frac{100}{1} =$$

PERCENT RECOVERY UNTIL THREE MONTHS AFTER INJURY

$$\frac{0}{6} \times \frac{100}{1} = 0 \text{ PERCENT RECOVERY UNTIL THREE MONTHS AFTER INJURY}$$

Calculation of percentage recovery between three and six months:

$$\frac{\text{SUM OF YES ATTAINED FOR APPLICABLE ITEMS AT SIX MONTHS NOT ADDED PREVIOUSLY}}{\text{NUMBER OF APPLICABLE ITEMS}} \times \frac{100}{1} =$$

PERCENTAGE RECOVERY BETWEEN THREE AND SIX MONTHS AFTER INJURY

$\frac{2}{6} \times \frac{100}{1} = 33.33$ PERCENTAGE RECOVERY BETWEEN THREE AND SIX MONTHS AFTER INJURY

Calculation of percentage recovery between six and 12 months:

$$\frac{\text{SUM OF YES ATTAINED FOR APPLICABLE ITEMS AT 12 MONTHS NOT ADDED PREVIOUSLY}}{\text{NUMBER OF APPLICABLE ITEMS}} \times \frac{100}{1} =$$

PERCENTAGE RECOVERY BETWEEN SIX AND 12 MONTHS AFTER INJURY

$\frac{4}{6} \times \frac{100}{1} = 66.66$ PERCENTAGE RECOVERY BETWEEN SIX AND 12 MONTHS AFTER INJURY

Calculation of percentage recovery at 12 months after injury:

Add the percentage recovery for the three time intervals i.e. until three months, between three to six months and six to 12 months to obtain the overall percentage of recovery achieved by the patient.

Example:
Until three months: 0 percent
Three to six months: 33 percent
Six to 12 months: 67 percent
i.e. after 12 months the patient had achieved 100 percent recovery related to feeding.

All aspects of recovery are calculated in this manner.

b. ASSESSMENT OF PRESENT STATUS OF PATIENT

PURPOSE

Information was required in order:
To assess the comprehensive care and recovery of the moderate and severely head injured patient two years after injury.

To discuss current problems experienced by the patient and family.
To advise the families regarding further care and/or rehabilitation of the patient.

RESEARCH TECHNIQUE

Observation.
The visit/consultation was unstructured. During the visit the researcher noted the family circumstances and the extent of recovery of the patient in terms of physical, psychosocial, emotional and behavioural recovery (APPENDIX E12).
Where it was not possible to visit the family (two patients) the researcher telephoned the family to obtain the relevant information.

INSTRUMENT DESIGN

The data sheet contains nine items.

TABLE 4:16

The design of the data sheet: Assessment of present status of patient

Item number	Information requested
1	Accommodation.
2	Daily activities.
3	Patient's problems.
4	Medication.
5	Remarks.

7. THE STUDY OF QUALITY ASSURANCE AND THE COMPREHENSIVE CARE OF THE HEAD INJURED PATIENT

PURPOSE

To evaluate the comprehensive care of the moderate and severely head injured patient in terms of the prescription, the frequency, the extent, norm and weighted norm of care received by the patient, irrespective of who delivered the care.

RESEARCH TECHNIQUE

Concurrent auditing involving the technique of non-participant observation was employed to evaluate the care received by the moderate and severely head injured patient.

7.1 SITUATIONAL ANALYSIS

The environment in which the head injured patient receives care must be conducive to nursing excellence. A situational analysis was completed on commencement of the observation period.

PURPOSE

To document factors relating to the environment that may have a direct or indirect effect on the comprehensive care of the moderate and severely head injured patient. These included the assessment of:
Staffing;
Bed occupancy;
Overall patient dependency.
Thereafter to correlate the situational analysis and the quality of care received by moderate and severely head injured patients.

RESEARCH TECHNIQUE

Concurrent auditing (APPENDIX F1).
After the patient assignment for the shift had been allocated the observer obtained the relevant information from the professional nurse-in-charge.

INSTRUMENT DESIGN

The instrument consists of six items divided into three sections. The items require factual information as to the day, shift, staff on duty, bed occupancy and overall patient dependency.

TABLE 4:17

The design of the situational analysis data sheet

Item	Information sought
1	Staffing.
2	Bed occupancy.
3	Overall patient dependency.

Staffing

The observer was required to record:
The rank of the professional nurse-in-charge of the shift;
The number and rank of nursing personnel on duty during the period of observation, irrespective of their work assignment;
The number and rank of nursing personnel allocated to work in the specific cubicle in which the observation was to be undertaken;
The length of time for which nursing personnel were allocated to the specific cubicle.

DEFINITION OF TERMS SPECIFIC TO THIS STUDY

TABLE 4:18

Explanation of terms

Term			Definition
STAFFING	Full shift		Six hours.
	Part shift		Less than six hours.
	General allocation		No specific staff are allocated to that particular cubicle for the shift. Care is provided by various personnel on a functional or laissez faire basis.
BED OCCUPANCY	Number of beds open		The unit has 30 bed spaces, but hospital policy permits the use of 28 beds only.
	Number of occupied beds		Total number of beds occupied during the period of observation.
	Medical diagnosis	Trauma	Beds occupied by patients who have suffered general trauma.
		Head injuries	Beds occupied by patients who have suffered a head injury. In the event that the patient is a victim of a head injury and general trauma the patient is classified in the category 'Head injuries'.

Bed occupancy

Bed occupancy is divided according to the medical diagnosis of patients.

Overall patient dependency

The dependency of all patients in the unit was calculated by the professional nurse-in-charge of the shift. As the researcher did not believe it to be necessary to calculate detailed patient dependency for all patients in the unit, a simple means of classifying overall patient dependency was compiled by the researcher (APPENDIX F2). Overall patient dependency was classified according to the level of independence of the patient namely total care, intermediate care and mobile patients. Overall patient dependency was calculated for:

1. The total unit.
2. The cubicle in which the observation was being undertaken.

7.2 METHODOLOGY FOR CONCURRENT AUDITING

7.2.1 SELECTION OF TOPIC

Evaluating the quality of care received by moderate and severely head injured patients in terms of the prescription for care, the frequency of care, the patient care standards, the extent, norm and weighted norm of care received, irrespective of who delivered the care.

7.2.2 THE SELECTION OF ASPECTS RELEVANT TO THE COMPREHENSIVE CARE OF THE MODERATE AND SEVERELY HEAD INJURED PATIENT

a. THE ASPECTS OF COMPREHENSIVE CARE

Those aspects selected for inclusion in the study are referred to as modalities of care and are evaluated in terms of the quality of care received by moderate and severely head injured patients.

DEFINITION OF TERMS SPECIFIC TO THIS STUDY

NURSING INTERVENTION

All schedules relating to the extent, norm and weighted norm of care received by moderate and severely head injured patients that are included in the provision of direct nursing care, namely:

PATIENT ASSESSMENT

All schedules relating to the assessment of the patient's clinical status. This is further sub-divided into:

NEUROLOGICAL ASSESSMENT:

Those aspects of care received that are related to the assessment of the patient's neurological status, namely:
LEVEL OF CONSCIOUSNESS (L.O.C.);
PUPILS (Pl);
LIMBS (Li);
CEREBROSPINAL FLUID LEAK (C.S.F.);
SEIZURE ACTIVITY (S.A.);
HEADACHE (H);
NAUSEA AND VOMITING (N&V);
VISUAL DISTURBANCES (V.D.).

VITAL SIGNS:

Those aspects of care received that are related to the assessment of the patient's vital signs, namely:
BLOOD PRESSURE (BP);
PULSE (P);
RESPIRATION (R);
TEMPERATURE (T).

PATIENT CARE

Those aspects of care received that are related to patient hygiene and position, namely:
EYE CARE (E);
OROPHARYNGEAL CARE (O);
BRONCHIAL TOILET (B);
UROGENITAL CARE (U);
CHANGE OF POSITION (C.o.P.).

PATIENT INDEPENDENCE

Those aspects of care that relate directly to patient independence, namely:
COMMUNICATION I - PATIENT (Com I/CI);
COMMUNICATION II - FAMILY (Com II/CII);

MOBILITY (Mob);
EXERCISE THERAPY (Ex);

MOTIVATION AND STIMULATION OF THE PATIENT (M & S):
GENERAL (G);
ACTIVITY (A);
THERAPEUTIC USE OF RADIO (R);
THERAPEUTIC USE OF TAPE RECORDER (T);
THERAPEUTIC USE OF TELEVISION (TV).

PROMOTION OF INDEPENDENCE (P.o.I.).

CATEGORIES OF PERSONNEL:

COMBINED (Comb)

Those aspects of care, mainly in relation to the performance of BRONCHIAL TOILET and CHANGE OF POSITION, undertaken by a combination of various categories of nursing personnel and/or the physiotherapist in the unit.

MULTIDISCIPLINARY (Multi)

Those aspects of care received that relate directly to the multidisciplinary team.

TABLE 4:19

Modalities of care included in the study as part of comprehensive management of the head injured patient

Patient assessment (N=12)	Patient care (N=5)	Patient independence (N=10)
Neurological observations: Level of consciousness Pupils Limbs Cerebrospinal fluid leak Seizure activity Headache Nausea and vomiting Visual disturbances Vital signs: Blood pressure Pulse Respiration Temperature	Eye care Oropharyngeal care Bronchial toilet Urogenital care Change of position	Communication: Patient Family Mobility Exercise therapy Motivation and stimulation: General Activity Use of the radio Use of the tape recorder Use of television Promotion of independence

TABLE 4:20

Modalities of care that are examined in terms of the prescription, patient care standards, the frequency, extent, norm and weighted norm of care received

Modality of care (N=17)			Quality of care				
			Prescription	Patient care standards	Frequency	Extent	Norm and weighted norm
Patient assessment	Neurological observations	Level of consciousness	√	√	√	√	√
		Pupils	√	√	√	√	√
		Limbs	√	√	√	√	√
		Cerebrospinal fluid leak	√	√	√	√	√
		Seizure activity	√	√	√	√	√
		Headache	√	√	√	√	√
		Nausea and vomiting	√	√	√	√	√
		Visual disturbances	√	√	√	√	√
	Vital signs	Blood pressure	√	√	√	√	√
		Pulse	√	√	√	√	√
		Respiration	√	√	√	√	√
		Temperature	√	√	√	√	√
Patient care		Eye care	√	√	√	√	√
		Oropharyngeal care	√	√	√	√	√
		Bronchial toilet	√	√	√	√	√
		Urogenital care	√	√	√	√	√
		Change of position	√	√	√	√	√

KEY: √ = applicable

TABLE 4:21

Modalities of care that are evaluated in terms of extent, norm and weighted norm of care received

Modality of care (N = 10)		Quality of care	
		Extent	Norm and weighted norm
Patient independence	Communication (2)	√	√
	Mobility	√	√
	Exercise therapy	√	√
	Motivation and stimulation (5)	√	√
	Promotion of independence	√	√

KEY: √ = applicable

PLEASE NOTE:

This does not mean that aspects of care such as intracranial pressure monitoring, hydration, nutrition, elimination and drug administration are not important, merely that for the purpose of this study measurement of those aspects of care was not undertaken.

THE RELATIONSHIP OF THE MODALITIES OF HEAD INJURY PATIENT MANAGEMENT TO NURSING, THE MULTIDISCIPLINARY APPROACH AND REHABILITATION

All 27 modalities of care have some direct or indirect bearing on nursing, team intervention, recovery and rehabilitation. 15 modalities of care received by the patient are as a result of direct nursing intervention. BRONCHIAL TOILET and CHANGE OF POSITION may be contributed to by other members of the team. 10 modalities measure the care received by the patient as a result of team intervention.

TABLE 4:22

The relevance of nursing, the multidisciplinary team and rehabilitation to the modalities of care under study

Modality of care (N=27)			N	M	RD	RI
Patient assessment	Neurological observation	Level of consciousness	√	-	◊	-
		Pupils	√	-	◊	-
		Limbs	√	-	◊	-
		Cerebrospinal fluid leak	√	-	◊	-
		Seizure activity	√	-	◊	-
		Headache	√	-	◊	-
		Nausea and vomiting	√	-	◊	-
		Visual disturbances	√	-	◊	-
	Vital signs	Blood pressure	√	-	◊	-
		Pulse	√	-	◊	-
		Respiration	√	-	◊	-
		Temperature	√	-	◊	-
Patient care		Eye care	√	-	-	•
		Oropharyngeal care	√	-	-	•
		Bronchial toilet	√	X	-	•
		Urogenital toilet	√	-	-	•
		Change of position	√	X	-	•
Patient independence		Communication I - patient	√	X	◊	-
		Communication II - family	√	X	◊	-
		Mobility	√	X	◊	-
		Exercise therapy	√	X	◊	-
		Motivation and stimulation:				
		General	√	X	◊	-
		Activity	√	X	◊	-
		Use of radio	√	X	◊	-
		Use of tape recorder	√	X	◊	-
		Use of television	√	X	◊	-
		Promotion of independence	√	X	◊	-

KEY:

N = Nursing (Specific nursing care)
M = Multidisciplinary team (General considerations to health care).
RD = Affect rehabilitation directly.
RI = Affect rehabilitation indirectly.

√ = applicable
X = applicable
◊ = applicable
• = applicable

b. EVALUATING THE QUALITY OF CARE RECEIVED

A brief introduction to the prescription, frequency, extent, norm and weighted norm of care received is presented.

(i) EVALUATING THE PRESCRIPTION AND FREQUENCY OF CARE RECEIVED

In order to provide a quality nursing service for moderate and severely head injured patients modalities of care must be prescribed by the registered nurse or doctor-in-charge of the patient. The care must be prescribed and performed according to the needs of the individual patient, as established by means of the nursing process and the standards of practice for moderate and severely head injured patients. The care modalities examined in terms of the prescription and frequency of care received are mentioned in TABLE 4:20.

PURPOSE

To examine the quality of care received by head injured patients in terms of both the prescription and frequency of performance of care.
To determine the relationship between the care prescription, the prescribed frequency, the frequency of performance of care and established patient care standards (vide p155).

INSTRUMENT DESIGN

The instrument for recording the information is a data sheet.
Explanation of the instrument designed to record the prescription and frequency of care received (APPENDIX G).

DEFINITION OF TERMS SPECIFIC TO THIS STUDY

TABLE 4:23

Explanation of terms

Term		Definition and/or instruction
Modality of care		14 aspects of care are listed.
Prescription	Care	The modalities of care prescribed by the registered nurse or doctor-in-charge.
	Frequency	The frequency of care corresponding to the modality of care prescribed by the registered nurse or doctor-in-charge.
Frequency received		The frequency of actual delivery of care as received by the patient during the observation period.
Patient care standards	Care	The established modalities of care that should be prescribed for the individual patient, based on the patient dependency rating and patient care standards.
	Frequency	The frequency of care corresponding to the modalities that should be prescribed for the individual patient, based on the patient dependency rating and patient care standards.
Inappropriate recording*		Care that is recorded but not actually performed.
✓		When inappropriate recording of care took place the tick corresponding to the time of the inappropriate recording was encircled.

*For an explanation of inappropriate recording of care vide p 287

IMPLEMENTATION

The observer to elicit the prescribed care modalities and the frequency of prescription of care must review the current nursing and medical record. The prescribed modalities and frequency of care must be recorded on the FREQUENCY OF CARE DATA SHEET (APPENDIX G).

TABLE 4:24

An example of a frequency of care data sheet designed for one observational shift

Modality of care	Prescription		Frequency received (to the nearest hour)								Patient care standards	
	Care	Frequency	7	8	9	10	11	12	13	Total	Care	Frequency
Level of consciousness	◊	2H		√		√		√		3	◊	1H
Limbs	X	X									◊	1H
Pupils	◊	2H		√		√		√		3	◊	1H
Seizure activity												
Cerebrospinal fluid leak	X	X									◊	1H
Headache												
Nausea and vomiting												
Visual disturbances												
Blood pressure	◊	2H		•		√		√		2	◊	1H
Pulse	◊	2H		•		√		√		2	◊	1H
Respiration	X	X									◊	1H
Temperature	◊	2H				√		√		2	◊	1H
Eye care	◊	2H	•		•			√		1	◊	2H
Oropharyngeal care	◊	2H		•		√		•		1	◊	2H
Bronchial toilet	◊	2H		√		√		√		3	◊	2H
Urogenital care	◊	6H							√	1	◊	6H
Change of position	◊	2H		√		√			√	3	◊	2H

KEY: ◊ = Prescribed √ = Received • = Not received X = Not prescribed

SCORING OF CARE (vide p164)

(ii) PATIENT CARE STANDARDS

The patient care standards have been compiled by the researcher for use with patients suffering from moderate or severe head injuries (APPENDIX K). (Vide p155 for further discussion).

(iii) EVALUATING THE EXTENT, NORM AND WEIGHTED NORM OF CARE RECEIVED

PURPOSE

To establish the quality of care received by head injured patients in terms of:

The extent of care received

Evaluating the extent of care received by head injured patients was undertaken in order to assess whether pre-set criteria were/were not being performed/undertaken.

This involved a YES/NO/NOT APPLICABLE answer and the item weightings of 6, 3, 2, 1 and 0 (vide p161).

Evaluating the extent of care assessed whether the care was undertaken but not the level of the care received.

In the opinion of the researcher the knowledge that the task is or is not completed is insufficient. The level of performance must be specified.

The norm of care received

Evaluating the norm of care received was undertaken in order to assess the standard or level of the care received by the head injured patient.

The norm of care was compared with pre-set standards of practice that relate to the stated criteria (vide p67/149/153). The norm of care was based on an arbitrary chosen ordinal scale represented by the values of 5 → 0 for BEST CARE, BETWEEN, AVERAGE CARE, BETWEEN, POOREST CARE and NO CARE given.

The weighted norm of care received

Evaluating the weighted norm of care received assessed the standard or level of practice when each criterion was weighted according to its significance in the particular schedule.

The weighted norm of care was compared with the pre-set standards of practice that related to the stated criteria. The weighted norm of care was based on the arbitrary scale of 5 → 0 (that is used for norm of care) as well as the value assigned to each criterion (i.e. the item weighting of 6, 3, 2, 1, 0). (Vide p161 for further discussion).

IMPLEMENTATION

For a description of the instrument used to measure the extent, norm and weighted norm of care vide p156.

SCORING OF CARE (Vide p168).

7.2.3 ESTABLISHING CRITERIA FOR MEASURING THE EXTENT, NORM AND WEIGHTED NORM OF CARE RECEIVED BY THE MODERATE AND SEVERELY HEAD INJURED PATIENT

The study included the compilation of a set of criteria that measured the extent, norm and weighted norm of care received by moderate and severely head injured patients for comparative purposes. For criteria detail per modality of care refer to APPENDIX I1 - 27.

As head injured patients were nursed by registered and non-registered nursing personnel, explicit objective criteria to evaluate the extent, norm and weighted norm of care received by head injured patients in-depth, were needed. No quality assurance module of this nature was available in The Hospital, therefore detailed criteria to validate the research findings were required. Vague, broad statements regarding the criteria for quality care would neither be acceptable nor suffice, as these would speak once again in principle and not in detail. Criteria included in the study needed to be pertinent to The Hospital. Measuring the quality of care against criteria of quality care not familiar to, practised or acceptable to The Hospital would have been meaningless.

THE RELATIONSHIP OF THE QUALITY ASSURANCE STUDY TO THE STRUCTURE, PROCESS AND OUTCOME CRITERIA

The principles of excellence in care are incorporated in the schedules. Criteria in respect of structure, process and outcome were isolated and where possible combined within the specific schedules.

a. The study overall

TABLE 4:25

The relationship of the overall study to the three approaches to quality assurance

Structure	Process	Outcome
Situational analysis: Staff allocation. Bed occupancy. General patient dependency. Patient dependency rating. Patient care standards. Prescription for care. Unit personnel questionnaires.	Retrospective audit. Concurrent nursing audit.	Multidisciplinary audit. Patient interview. Patient questionnaire. Visit/Consultation.

Structure is assessed in terms of the situational analysis, patient dependency rating, prescription for care, patient care standards, education and clinical expertise of staff. Process is examined in terms of the multidisciplinary and nursing audit. Outcome is examined in terms of the multidisciplinary audit and patient recovery.

b. **The modalities of comprehensive care that are examined in terms of structure, process and outcome**

TABLE 4:26

Schedules that contain a component of all three aspects of quality assessment

Modality of care (N=15)	
Patient care	Eye care Bronchial toilet Urogenital care Change of position
Patient independence	Communication (2) Mobility Exercise therapy Motivation and stimulation (5) Promotion of independence

TABLE 4:27

Schedules relating to patient management that measure process alone

Modality of care (N=12)	
Neurological observations	Level of consciousness Pupils Limbs Cerebrospinal fluid leak Seizure activity Headache Nausea & vomiting Visual disturbances
Vital signs	Blood pressure Pulse Respiration Temperature

All schedules measure outcome indirectly due to the fact that the quality of care received by moderate and severely head injured patients affects morbidity and mortality (Fölscher, 1974).

Prior to commencing the study in order to prevent bias discussion regarding the criteria selected to measure the quality of care was limited, as it was important that those concerned with the study were not aware of the aspects of care that were actually being evaluated. The researcher, at this stage, did not consult nursing experts in the field to establish criteria for measuring the extent, norm and weighted norm of care as standardised methods of performing some of the care modalities were available in The Hospital. Pre-determined criteria, according to the procedures, as set out by the Internal Hospital Policy and Clinical Teaching Department's protocols, were utilized to compile the set of criteria for the study.

According to the Chief Matron of Education (APPENDIX H1, H2), procedure protocols were available for the following modalities of care:

Beds and backs.
Blood pressure.
Catheter care.
Mouth care.
Pulse.
Respiration.
Temperature.
Tracheostomy care.

Where no existing protocol for care was available the researcher compiled criteria by :

1. Using textbooks.
2. Discussion with the Professors of Nursing and Neurosurgery of The University of the Witwatersrand.
3. Drawing on clinical experience in neurosurgical nursing.

The establishment of criteria allowed the researcher to measure the extent, norm and weighted norm of care received by moderate and severely head injured patients. A total of 27 schedules comprising 983 criteria were compiled to form the quality assurance module for evaluating the care received by the head injured patients in the unit.

TABLE 4:28

Summary of the number of quality assurance criteria included in the study

Modality of care	Number of schedules	Title of schedule (named per intervention)	Number of criteria per schedule	Total number	
				Schedules	Criteria
Patient assessment:				12	377
Neurological observations				8	276
	1	Level of consciousness	60		
	1	Pupils	38		
	1	Limbs	64		
	1	Cerebrospinal fluid leak	28		
	1	Seizure activity	32		
	1	Headache	15		
	1	Nausea and vomiting	21		
	1	Visual disturbances	18		
Vital signs				4	106
	1	Blood pressure	35		
	1	Pulse	17		
	1	Respiration	17		
	1	Temperature	37		
Patient care				5	252
	1	Eye care	34		
	1	Oropharyngeal care	43		
	1	Bronchial toilet	57		
	1	Urogenital care	56		
	1	Change of position	62		
Patient Independence				10	349
	1	Communication I - Patient	21		
	1	Communication II - Family	15		
	1	Mobility	31		
	1	Exercise therapy	43		
		Motivation and stimulation:			
	1	General	45		
	1	Activity	15		
	1	Use of radio	26		
	1	Use of tape recorder	42		
	1	Use of television	40		
	1	Promotion of independence	71		
TOTAL			983	27	983

7.2.4 COMPILING STANDARDS OF PRACTICE

a. COMPILING STANDARDS OF PRACTICE TO MEASURE THE NORM AND WEIGHTED NORM OF CARE

Once care criteria were established standards of care against which the norm of care received could be measured, needed to be established. The staff establishment for the unit included registered and non-registered nursing personnel, all of whom deliver care

to the head injured patients, therefore to state that the standard of measurement "...is the quality of care a first level staff nurse is expected to provide" (Wandelt & Ager, 1974: 33) would not suffice. To avoid bias and subjective judgement it was necessary to compile standards of practice applicable to the care received by the head injured patient that maintained excellence in health care, irrespective of which category of personnel delivered the care.

Internal Hospital Policy, clinical department protocols, textbooks and the nursing process were used to establishing standards of practice against which the actual care received could be measured (APPENDIX J1 - 27). The standards of practice that were compiled are guides to fundamental, effective, safe, therapeutic nursing practice and the delivery of a quality nursing service (vide p68). They must be read in conjunction with the schedules (APPENDIX I1 - 27). For each criterion there are set standards of practice with which the norm of care received by the head injured patient can be compared. ± 3 932 standards of practice have been established for use with the 27 schedules i.e. ± four standards per criterion. The standard practice guides are hereafter referred to as practice guides.

DESCRIPTION OF PRACTICE GUIDES

(As an example: APPENDIX J 10 Read in conjunction with APPENDIX I 10))

Topic heading - Right hand corner.

ITEM NUMBER - The item number corresponds with the criterion on the schedule. Standards of practice are stated per ITEM NUMBER for 'BEST CARE', 'AVERAGE CARE', 'POOREST CARE' and care that is 'NOT APPLICABLE'. No column is allocated to 'NO CARE'.

UTILIZING THE PRACTICE GUIDES

The practice guides must be studied prior to the observer/s undertaking the prescribed observation. The observer/s rated the care received according to the set standard of practice. The observer/s judged and recorded the action received in terms of BEST CARE, BETWEEN, AVERAGE CARE, BETWEEN, POOREST CARE, NO CARE and NOT APPLICABLE care. Where a criterion should have been undertaken but was omitted (i.e the answer to the criterion was 'NO'), or no care was performed in relation to the criterion the observer rated NO CARE. In the event of an action or reaction occurring that was not stated in the practice guide the observer/s rated the activity according to what was believed to be safe, effective, therapeutic practice.

b. COMPILING INDIVIDUAL PATIENT CARE STANDARDS

The researcher on completion of the literature review compiled a set of patient care standards specific to the moderate and severely head injured patient (APPENDIX K). The patient care standards based on the individual needs of the particular patient equate with that level of care that is regarded as safe, effective, therapeutic nursing intervention. The patient care standards are patient specific and refer to the modalities and frequency of care that should be prescribed, on a daily basis, by the primary nurse, within the framework of nursing excellence, according to the needs of the individual patient.

PURPOSE OF ESTABLISHING PATIENT CARE STANDARDS

To evaluate the quality of care received by moderate or severely head injured patients utilizing accepted standards of practice for these patients.
To assess the effectiveness of the prescription for care in terms of the modalities and frequency of care prescribed and established standards of practice.

IMPLEMENTATION

Prior to establishing patient care standards for the individual patient the observer completed the following data sheets:

1. Patient assessment on:
   - The day of admission (APPENDIX E 1).
   - The day of observation (APPENDIX E 2).
     Noting in particular:
     The length of time after injury.
     The Glasgow Coma Scale score.
     The condition of the patient.
     Other injuries.
2. The patient dependency rating (APPENDIX E3:1)

Then the observer, utilizing the above information and the patient care standards established the standards of practice for the individual patient. In general all patients with a Glasgow Coma Score of ≤ 8/15 require the same modalities and frequency of care.

Patient care standards in terms of the modality and frequency of care that should be prescribed must be noted in the appropriate columns by means of a tick (√) on THE FREQUENCY OF CARE DATA SHEET (APPENDIX G). Vide p146/147 or explanation of terms relating to patient care standards and for an example of a completed frequency of care data sheet.

7.2.5. CONSTRUCTION OF THE TOOLS FOR USE IN THE QUALITY ASSURANCE STUDY

The compilation of criteria and standards for care of the moderate and severely head injured patient is meaningless, unless there is a tool with which to measure the quality of care (vide p68). Thus, the next step was to compile a tool with which to check the extent, norm and weighted norm of care received. In the literature the researcher has not found a module specifically designed for the measurement of care received by moderate and severely head injured patients. The following steps were taken in order to compile the tool for measurement:

a. REVIEW OF PREVIOUS METHODOLOGIES AND RESEARCH

Qualpacs (Wandelt & Ager, 1974), The Slater Nursing Competencies Rating Scale (Wandelt & Stewart, 1975) and the HEW Scale (Jelinek, 1975) are the most relevant quality assessment scales. Although certain sections have been adapted for the purpose of this particular study they could not be used in their entirety. The lack of suitability of the afore-mentioned research methodologies stems from the fact that:

(i) The criteria stated are in broad terms (vide p149).

(ii) The standard of care stated by Wandelt and Ager (1974) and Wandelt and Stewart (1975) is that of a first level staff nurse. Therefore for this study as both registered and non-registered nursing personnel were involved these methodologies were not acceptable.

(iii) This study examines process as described by Donebedian (1966) in greater detail than either Wandelt and Ager (1974) or Wandelt and Stewart (1975).

b. CRITERIA WERE IDENTIFIED FOR INCLUSION IN THE TOOL

(Vide p65/149).

c. DESIGN OF INSTRUMENT

An example of the actual instrument of measurement is introduced in order to familiarise the reader with the format of the instrument, prior to the discussion on designing the tool (vide p158).

The basic design of the research instrument is that of a checklist, hereafter referred to as a schedule. 27 schedules, based on the same format, were used in the study.

TABLE 4:29

Explanation of identifying data on the schedule

Term	Definition
Identifying data	Patient particulars.
Procedure number	Each time the same procedure is performed consecutive numbers are placed in this space. The number of times the procedure is performed is required to check the sequence and frequency of care received.
Rank and name of care giver/s	Both the rank and name of the care giver/s must be recorded.
Time observation	Note the time the observation is commenced and completed.

In the study, rank is correlated with the quality of care received and the name of the care-giver with neurosurgical knowledge. For the purpose of data storage no name, but codes appear on the computer, thus preserving anonymity.

HEAD INJURY RESEARCH

NAME OF PATIENT: _____ CASE NO.: [ ]

REGISTRATION NO.: _____ RATER: _____

PROCEDURE NO.: [/] WARD: [ ]

RANK & NAME OF CARE GIVER/S: DATE: _____

TIME OBSERVATION:
COMMENCED [ ][ ][ ][ ][ ]
COMPLETED [ ][ ][ ][ ][ ]

1	2	3	4	5	6	7	8	9	10	11	12	13
		EXTENT			NORM							
PULSE	ITEM NUMBER	WEIGHTING	YES	NO	NOT APPLICABLE	BEST CARE	BETWEEN	AVERAGE CARE	BETWEEN	POOREST CARE	NO CARE	NOT APPLICABLE	REMARKS
			1	0		5	4	3	2	1	0		
Checks patient's observation chart	1	1											
Ensures patient's privacy	2	1											
Explains procedure to patient	3	2											
Washes hands:													
On commencement of observation	4	1											
On completion of observation	5	1											
Talks to patient during procedure	6	1											
Feels radial pulse (feels another site only if radial inaccessible)	7	3											
Records pulse fo full minute	8	3											
Makes recordings on chart:													
Rate	9	6											
Rhythm	10	2											
Volume	11	1											
Reports findings to:													
Nurse	12	3											
Sister	13	3											
Doctor	14	3											
Other	15	3											
Intervention:													
Ordered	16	3											
Carried out	17	3											

Fig. 4:3 An example of the schedule: PULSE

HEADINGS RELATED TO EXTENT AND NORM OF CARE

The topic of the particular schedule is stated in the large block on the left hand side of the instrument above the list of criteria.

Headings of columns:

These appear above the columns on the right half of the instrument.

Column numbers are not stated on the instruments.

The headings are divided into four sections by a darker black line.

All headings are self-explanatory.

TABLE 4:30

Explanation of the schedule designed to measure the extent, norm and weighted norm of care received

Column number	Heading	Explanation
1	ITEM NUMBER	Each criterion is itemised. The item number applies throughout the study and is used for the practice guides and computer coding.
2	WEIGHTING*	For the purpose of the presentation the weightings have been included. The weighting is not stated on the schedules used by the observers.
3 4 5	YES NO NOT APPLICABLE	} These are self-explanatory relating to the extent of care. Answering the question 'Is the care undertaken?'
6 7 8 9 10 11 12	BEST CARE BETWEEN AVERAGE CARE BETWEEN POOREST CARE NO CARE NOT APPLICABLE	} These are self-explanatory relating to the norm of practice. Answering the question 'What is the level of the care undertaken?'
13	REMARKS	Any additional action, reaction may be recorded.

*Vide p 161 for further discussion regarding the weighting of items.

DESCRIPTION OF THE CONTENTS OF THE SCHEDULES

For the purpose of assessing the 27 modalities relating to the quality of care of moderate and severely head injured patients in terms of the extent, norm and weighted norm of care the criteria have been itemised (vide p66/149/APPENDIX I). The number of items vary according to the particular schedule. The total number of items is 983.

Placement of items

To decrease confusion and repetition items were placed in rank order (i.e. the sequence of the procedure is followed) or group order (i.e. an aspect of the procedure is completed).

TABLE 4:31

Extracts from the schedules LEVEL OF CONSCIOUSNESS and BLOOD PRESSURE to illustrate the placement of items in rank order

Schedule	Criterion		Item number
LEVEL OF CONSCIOUSNESS	Assesses level of consciousness according to Glasgow Coma Scale:		9
	EYE OPENING.		10
	Assesses patient's ability to open eyes:		
	SPONTANEOUS.	4	11
	TO SPEECH.	3	12
	TO PAIN.	2	13
	NIL.	1	14
	BEST MOTOR RESPONSE.		15
	Assesses patient's ability to:		
	OBEY COMMANDS.	6	16
	LOCALISES PAIN.	5	17
	WITHDRAWS FROM PAIN.	4	18
	ABNORMAL FLEXION.	3	19
	EXTENSOR RESPONSE.	2	20
	NIL.	1	21
	BEST VERBAL RESPONSE.		22
	Assesses patient's verbal ability:		
	ORIENTATED.	5	23
	To time.		24
	To place.		25
	To person.		26
	CONFUSED CONVERSATION.	4	27
	INAPPROPRIATE WORDS.	3	28
	INCOMPREHENSIVE SOUNDS.	2	29
	NIL.	1	30
BLOOD PRESSURE	Feels radial pulse.		13
	Blows up cuff to just above obliteration of radial pulse.		14
	Releases bulb.		15
	Feels for brachial pulse.		16
	Pumps up bulb to 30 mm.Hg more than obliteration of radial pulse to obtain systolic pressure.		17
	Places stethoscope in ears.		18
	Places head of stethoscope on brachial pulse.		19
	Releases mercury slowly.		20

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