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The comprehensive care of the moderately to severely head injured patient

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2015-05-18
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TABLE 4:32

Extracts from the schedules BRONCHIAL TOILET and UROGENITAL CARE to illustrate the placement of items in group order

Schedule	Criterion	Item number
BRONCHIAL TOILET	Suctioning:	
	Opens suction catheter.	24
	Connects suction catheter.	25
	Uses gauze to hold suction catheter.	26
	Inserts suction catheter:	
	Suctions for first time as going down.	27
	At other times inserts with suction released.	28
	Suctions for < 10 seconds.	29
	Withdraws catheter in circular motion.	30
	Cleans suction catheter through.	31
	Suctions patient until secretions cleared:	32
	Suctions right bronchus-head neutral position.	33
	Suctions left bronchus-head turned to right.	34
	Maintains aseptic technique throughout suctioning.	35
UROGENITAL CARE	Washes hands:	
	Prior to setting up.	7
	On commencement of procedure.	8
	On completion of procedure.	9

7.2.6 QUANTIFICATION OF FACTORS COMPRISING THE TOOL

a. Care levels

An arbitrary scale has been used to categorise the prescription, frequency, extent, norm and weighted norm of care received by head injured patients. The scale is based on a range of 0 - 100 percent.

TABLE 4:33

Levels of care

Care category	Percent
Excellent	≥ 80 - 100
Good	70 - 79
Moderate	60 - 69
Poor	50 - 59
Dangerous	≤ 50

b. The weighting of items

Prior to commencing the study a weighting system that applied to each criterion was introduced for use with both the 'extent of care' and 'weighted norm of care' received by moderate and severely head injured patients. The decision to weight items was taken by the Professors of Nursing and Neurosurgery and the researcher.

The weighting of items was considered necessary because of the varying significance of the criteria of care that were itemised (vide p69/149/APPENDIX I). Thus each criterion (item) was weighted according to its relevance to the particular schedule. The values selected for the purpose of weighting the items were arbitrary and were represented by the numbers 0, 1, 2, 3 and 6.

As an example:
The criteria related to hand washing cannot be weighted equally throughout the schedules as they are of greater significance when performing an aseptic technique (Schedule BRONCHIAL TOILET - ITEM 6 Weighting: 6 APPENDIX I15), than when completing observations (Schedule BLOOD PRESSURE - ITEM 2 Weighting: 1, APPENDIX I 9).

TABLE 4:34

Description of values for item weighting

Value assigned	Significance
0	Care that was undertaken that is not regarded as therapeutic or is of no benefit to the patient.
1	Basic care. Almost automatic routine nursing care. Less important care but care that is still required.
2	More important than 1 in relation to the schedule. Fundamental care for the particular schedule.
3	Most important. Essential care. Immediate care specific to the particular schedule.
6	Life threatening. Items of acute concern. Items of paramount importance to this schedule.
NOT APPLICABLE	No value is assigned if the item is not applicable to the performance of the procedure.

For details of the weighting of criteria vide APPENDIX 11-27.

c. **Extent of care**

TABLE 4:35

Rating scale and value assigned for extent of care received

YES	NO	NOT APPLICABLE
1	0	No value assigned

An arbitrary assigned rating scale (1,0) is used for rating the extent of care i.e. whether the care was performed or not performed/undertaken or not undertaken.

d. **Norm of care**

TABLE: 4:36

Rating scale and value assigned for norm of care received

Rating	BEST CARE	BETWEEN	AVERAGE CARE	BETWEEN	POOREST CARE	NO CARE	NOT APPLICABLE
Value	5	4	3	2	1	0	No value assigned

An ordinal scale has been used to rank the norm of care received. Arbitrary numbers were assigned for the purpose of calculating the norm of care received. Where the answer to the criterion is NO or where NO CARE in relation to the criterion is performed the value assigned is 0. Therefore the rating scale of $5 \rightarrow 1$ applies to care that was undertaken.

e. **Weighted norm of care**

The arbitrary values assigned to the item numbers (6, 3, 2, 1 and 0) and the norm of care ($5 \rightarrow 0$) are required in order to assess the weighted norm of care.

7.2.7 RELIABILITY AND VALIDITY TESTING OF INSTRUMENT

Reliability testing determines the consistency and stability of the tool. Validity testing determines the extent or degree to which a tool actually measures what it seeks to measure (vide p69).

a. **PILOT STUDY**

A pilot study was conducted in July, 1983.
Patient population: 10 cases.
Two raters were employed to check reliability and validity of the research tools.

The results of the pilot study showed:

(i) The need for two additional items to be included:

Schedule: PUPILS - ITEMS 22 and 25.

(ii) The need for certain items to be deleted.

This item 'The effectiveness of intervention ordered' needed to be deleted as the effectiveness of the intervention ordered was not immediately apparent and therefore not rateable.

(iii) The need for the wording of criteria to be altered.

Changing the wording of criteria was necessary in order to avoid confusion when rating.

Schedule: MOTIVATION AND STIMULATION/GENERAL: ITEMS 5 and 26.

Schedule: MOTIVATION AND STIMULATION/THERAPEUTIC USE OF RADIO: ITEM 1.The schedules proved valid to the extent that they measured what they set out to measure. According to the statistician, no appropriate statistical tests were available to test the reliability and validity of these specific research instruments. The pilot study demonstrated that differences in scores were directly related to the quality of care received and not to failure of the criteria to measure the quality of care.

All other research methodologies and the instruments of the research proved to be reliable and valid, such as the:

Survey sheet (APPENDIX D).

Patient interview schedule (APPENDIX E6).

The situational analysis (APPENDIX F1).

7.2.8 SCORING OF CARE

All scoring and calculations for this section of the study except for the pilot study were computerised (vide p67/69).

a. SCORING THE PRESCRIPTION FOR CARE

CALCULATION OF THE PRESCRIPTION FOR CARE

The prescription for care of the registered nurse is compared to that of the patient care standards (APPENDIX K), in order to establish the modalities of care that were and should be prescribed.

TABLE 4:37

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

No arithmetical calculation is undertaken with regard to the prescription of care modalities, a descriptive statement is made. **TABLE 4:37** (vide p165) shows the prescription for care and patient care standards for certain modalities of care regarded as relevant to the particular patient equate, namely:

LEVEL OF CONSCIOUSNESS	EYE CARE
PUPILS	OROPHARYNGEAL CARE
BLOOD PRESSURE	BRONCHIAL TOILET
PULSE	UROGENITAL CARE
TEMPERATURE	CHANGE OF POSITION

Modalities of care that have not been prescribed and according to the patient care standards should be prescribed include the assessment of LIMBS, CEREBROSPINAL FLUID LEAK and RESPIRATION.

Although the prescription for care and patient care standards for certain of the above modalities equate, the prescribed frequency of performing the care may alter.

b. SCORING THE FREQUENCY OF CARE

i.e. how often was a procedure/activity performed?
Simple arithmetical calculations are used to establish the percentage frequency of care received. The possible range for the frequency of care performed is 0-100 percent depending on the modalities of care prescribed and the frequency of care received.

CALCULATION OF THE SCORE OBTAINED FOR THE FREQUENCY OF CARE RECEIVED

When calculating the frequency of care received by moderate and severely head injured patients both the modalities of care prescribed according to the charge person and the patient care standards are considered.

(1) Percentage prescribed frequency

i.e. what percentage of the care prescribed by the Registered Nurse or physician-in-charge was undertaken by the staff member delivering the care.

Formula:

$$\frac{\text{FREQUENCY RECEIVED}}{\text{PRESCRIBED FREQUENCY}} \times \frac{100}{1} = \text{PERCENT PRESCRIBED FREQUENCY OF CARE RECEIVED}$$

In order to calculate the percentage prescribed frequency calculate the following:

FREQUENCY RECEIVED:
Note the number of times the prescribed care was performed.

PRESCRIBED FREQUENCY:
Note the number of times the care should have been performed according to the prescription of the Registered Nurse or physician-in-charge.

An example: PULSE (TABLE 4:37)

FREQUENCY RECEIVED = 2
PRESCRIBED FREQUENCY = 3

$$\frac{2}{3} \times \frac{100}{1} = 66.66 \text{ PERCENT PRESCRIBED FREQUENCY}$$

i.e. the patient received 66.67 percent of the care that should have been performed according to the prescribed frequency of performance for that particular patient.

(11) **Percentage standard frequency**

i.e. what percentage of the care that should be undertaken according to the patient care standards was undertaken.

Formula:

$$\frac{\text{FREQUENCY RECEIVED}}{\text{STANDARD FREQUENCY}} \times \frac{100}{1} = \text{PERCENT STANDARD FREQUENCY OF CARE RECEIVED}$$

In order to calculate the percentage standard frequency calculate the following:

FREQUENCY RECEIVED:
Note the number of times the prescribed care was performed.

STANDARD FREQUENCY:
Note the number of times the care should have been performed according to the patient care standards.

An example: PULSE (TABLE 4:37)
FREQUENCY RECEIVED = 2
STANDARD FREQUENCY = 6

$\frac{2}{6} \times \frac{100}{1} =$ 33.33 PERCENT STANDARD FREQUENCY OF CARE RECEIVED

i.e. according to the established standards of practice the head injured patient received 33,.3 percent of the care that should have been prescribed for the individual patient.

Lack of prescription of care.

Where according to the patient care standards care should be prescribed but the care modality and frequency was omitted from the prescription the formula is as follows:

$\frac{\text{FREQUENCY RECEIVED}}{\text{STANDARD FREQUENCY}} \times \frac{100}{1} =$ PERCENT STANDARD FREQUENCY OF CARE RECEIVED

e.g CEREBROSPINAL FLUID LEAK (TABLE 4: 37).

$\frac{0}{6} \times \frac{100}{1} =$ 0 PERCENT STANDARD FREQUENCY OF CARE RECEIVED

Thus the fact that the care was not prescribed resulted in no care related to this modality being received by the patient who required the care. Therefore both the prescription and performance of care are affected.

The results of the frequency of performance of care are discussed on an overall basis, per modality and per patient in terms of actual and recorded care (vide p287 for discussion of actual and recorded care).

c. SCORING FOR EXTENT OF CARE RECEIVED

i.e. when a modality of care (procedure) is performed to what extent was the care as itemised performed or not performed.

CALCULATION OF EXTENT OF CARE SCORE

The scoring system uses simple arithmetical calculations and involves calculations using the item weightings (6, 3, 2, 1, 0) that correspond to the ticks in the extent of care columns.

HEAD INJURY RESEARCH

NAME OF PATIENT: -

REGISTRATION NO.: -

PROCEDURE NO.: 2/6

CASE NO.: 1

RATER: N.M.A.

WARD: -

DATE: 1983.11.02

RANK & NAME OF CARE GIVER/S:

ST/N	-

TIME OBSERVATION:

COMMENCED	0	8	h	0	3	
COMPLETED	0	8	h	0	6	

PULSE	ITEM NUMBER	WEIGHTING	EXTENT: YES	EXTENT: NO	EXTENT: NOT APPLICABLE	NORM: BEST CARE	NORM: BETWEEN	NORM: AVERAGE CARE	NORM: BETWEEN	NORM: POOREST CARE	NORM: NO CARE	NORM: NOT APPLICABLE	REMARKS
	1	2	3	4	5	6	7	8	9	10	11	12	13
			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.4:4 An example of a completed schedule: PULSE

Formula:

$$\frac{\text{SUM OF YES EXTENT SCORE ATTAINED (SYS)}}{\text{TRUE EXTENT OF CARE SCORE (TES)}} \times \frac{100}{1} =$$

PERCENT EXTENT OF CARE RECEIVED

In order to calculate the percentage extent of care score calculate the following per schedule:

1. TOTAL EXTENT OF CARE SCORE (TS)
   Add the item weightings that correspond with the total number of items on the schedule.
   Schedule PULSE = 40

2. TOTAL EXTENT OF CARE SCORE OF "NOT APPLICABLE" ITEMS (TSNA)
   Add the item weightings of those items regarded as NOT APPLICABLE to the performance of the procedure /activity.
   Schedule PULSE = 9

3. TRUE EXTENT OF CARE SCORE (TES) = TS - TSNA
   Schedule PULSE 40 - 9 = 31

4. SUM OF EXTENT OF CARE SCORE ATTAINED FOR THOSE ITEMS IN THE "YES" COLUMN (SYS)
   Add the item weightings that correspond with the number of YES rated items on the schedule.
   Schedule PULSE = 27

$$\frac{\text{SYS}}{\text{TES}} \times \frac{100}{1} = \frac{27}{31} \times \frac{100}{1} = 87.10 \text{ PERCENT EXTENT OF CARE RECEIVED}$$

Thus 87.10 percent of the extent of care for the assessment of PULSE was undertaken.
CARE CATEGORY: EXCELLENT

d. SCORING OF NORM OF CARE

I.e. what is the level of care of those activities undertaken/not undertaken. Therefore in effect norm of care relates to the extent of care as one can only assess the level of practice of activities that were/were not undertaken.

(i) CALCULATION OF NORM OF CARE SCORE

The scoring system uses simple arithmetical calculations. Utilize the values of 5 --> 0 assigned to the norm of care to calculate the norm of care score. The norm of care score is independent of the item weighting.

TABLE 4:38

Rating scale and value assigned for norm of care received

BEST CARE	BETWEEN	AVERAGE CARE	BETWEEN	POOREST CARE	NO CARE	N/A
5	4	3	2	1	0	•

Formula:

$$\frac{\text{SUM OF NORM SCORE ATTAINED (SNS)}}{\text{TRUE NORM OF CARE SCORE (TNCS)}} \times \frac{100}{1} = \text{PERCENT NORM OF CARE RECEIVED}$$

Calculate:

1. TOTAL NORM OF CARE SCORE (NCS)
   Add the total number of items on the schedule multiplied by the maximum norm of care weighting of 5.
   Schedule PULSE 17 x 5 = 85

2. SCORE OF "NOT APPLICABLE" ITEMS (TSNNA)
   Add the number of NOT APPLICABLE items and multiply by maximum norm of care weighting of 5.
   Schedule PULSE 5 x 3 = 15

3. TRUE NORM OF CARE SCORE (TNCS)
   TNCS = NCS - TSNNA
   Schedule PULSE 85 - 15 = 70

4. SUM OF NORM SCORE ATTAINED (SNS)
   Add the norm of care values (i.e. 5, 4, 3, 2, 1,0) that correspond with the ratings (√) in the norm of care columns.

   Schedule PULSE : SNS = 43.

Calculation of example: Schedule PULSE

NCS = 85
TSNNA = 15
TNCS = 70
SNS = 43

$$\frac{SNS}{TNCS} \times \frac{100}{1} = \frac{43}{70} \times \frac{100}{1} = 61.43 \text{ PERCENT NORM OF CARE RECEIVED}$$

Thus the score achieved for the norm of care received was 61.43 percent.
CARE CATEGORY : MEDIOCRE

e. SCORING OF WEIGHTED NORM OF CARE

i.e. what is the standard of practice when the level of care is weighted according to the significance of the item in the schedule.

CALCULATION OF THE WEIGHTED NORM OF CARE SCORE

The scoring system uses simple arithmetical calculations. Utilize the norm of care value (5-0) and the item weighting (6,3,2,1,0) to calculate the weighted norm of care score.

Formula:

$$\frac{\text{SUM OF WEIGHTED NORM OF CARE SCORE ATTAINED (SWNS)}}{\text{TRUE WEIGHTED NORM OF CARE SCORE (TWNCS)}} \times \frac{100}{1} =$$

PERCENT WEIGHTED NORM OF CARE RECEIVED

Calculate:

1. TOTAL WEIGHTED NORM OF CARE SCORE (WNCS)
   Multiply the maximum norm of care value (5) by the item weighting per individual item.

TABLE 4:39

An example of the schedule PULSE to illustrate the calculation of the total weighted norm of care score

Item number	Item weighting	Norm of care score	Points
1	1	5	5
8	2	1	2
9	6	5	30
TOTAL POINTS			37

Add the total points to obtain the total weighted norm of care score.
Schedule PULSE: WNCS = 200

2. WEIGHTED SCORE OF "NOT APPLICABLE" ITEMS (TWNA)

Multiply the maximum norm score weighting (5) of the "NOT APPLICABLE" items by the item weighting. Add the results to obtain the weighted score of "NOT APPLICABLE" items.

TABLE 4:40

An example of the schedule PULSE to illustrate the calculation for NOT APPLICABLE items

Item number	Item weighting	Maximum norm of care value	Points
12	3	5	15
14	3	5	15
15	3	5	15
TOTAL POINTS			45

Number of NOT APPLICABLE items = 3
Schedule PULSE: TWNA = 45

3. TRUE WEIGHTED NORM OF CARE (TWNCS)

TWNCS = WNCS - TWNA
Schedule PULSE: 200 - 45 = 155

4. SUM OF WEIGHTED NORM OF CARE SCORE ATTAINED (SWNS)

Multiply the actual norm of care value (5, 4, 3, 2, 1, ,0) that correspond with the √ in the norm of care column by the item weighting, per item. Add the scores to obtain the actual sum of the weighted norm of care score.

TABLE 4:41

An example of the schedule PULSE to illustrate the calculation of the sum of the weighted norm of care score attained

Item number	Item weighting	Norm of care						Points
		5	4	3	2	1	0	
1	1	√						5
2	1			√				3
3	2					√		2
5	1						√	0
0	6	√						30
TOTAL POINTS								40

KEY: √ = Applicable

Schedule PULSE: SWNS = 119

Calculation of example: Schedule PULSE

WNCS = 200
TWNA = 45
TWNCS = 155
SWNS = 119

$$\frac{SWNS}{TWNCS} \times \frac{100}{1} = \frac{119}{155} \times \frac{100}{1} = 76.77$$

Thus the score achieved for the weighted norm of care received was 76.77 percent.
CARE CATEGORY: GOOD

7.2.9 EXPECTED COMPLIANCE

Watson and Mayers (1976) and Mayers, et al. (1977: 28) state that expected compliance of the modalities of care that are to be examined must be stated (vide p67). Prior to commencing the study the researcher estimated the expected level of compliance for the extent, norm and weighted norm of care received by moderate and severely head injured patients, per modality (APPENDIX L). The expected compliance that was estimated showed that the values expected for the assessment of vitals signs would be the highest. This would be followed by patient care, neurological assessment and lastly patient independence (vide p140).

7.2.10 THE USE OF THE SCHEDULES

The schedules were used to audit the quality of care received by the moderate and severely head injured patient.

a. No material was stored in the trauma unit because of the nature of the research.

b. Prior to the period of observation files containing relevant documents, based on the patient dependency rating and Glasgow Coma Scale scores of ≤ 12/15, were compiled by the researcher.

c. The schedules were used in conjunction with the practice guides. Extra instruments of the research and a file containing the practice guides for reference purposes accompanied the researcher.

d. The number of schedules completed per patient was determined by:
   (i) The prescription of the modalities and frequency of care.
   (ii) The frequency of care received.

Each time a procedure was commenced a new procedure schedule was completed, except for the schedules relating to patient independence where one schedule was completed per observation period.

e. THE METHOD OF RATING CARE

A simple method of rating was employed. Rating of care involved placing a tick (√) in the appropriate columns against the correct item number. Thus in most instances two ticks (one for extent and one for norm of care) were required per item. Extent of care items where no norm of care is indicated on the practice guides, only required one rating.

7.2.11 STATISTICAL ANALYSIS

Advice concerning the data was obtained from The Department of Statistics, The University of The Witwatersrand and The Institute for Medical Biostatistics, The South African Medical Research Council.

a. As the data relating to the epidemiological survey was manually sorted, there was to be no statistical testing.

b. The size of the sample (vide p123 for further discussion).

c. Limited statistical testing of the data relating to the quality assurance study would be performed. This is based on the following:

(i) No statistical test appropriate to the assessment of construct and content validity of the schedules incorporated in the quality assurance study, could be found. The Kuder - Richardson test was not applicable (Uys & Basson, n.d.: 70).

(ii) The statisticians believed that:

- The data was descriptive in nature.

- **In the quality assurance study in most instances the standard for comparison was 100 percent, therefore statistical validation was not regarded as being warranted; using the mean values a description of the data would suffice.**

- For statistical tests to be of true proven value variables must be independent of each other. The statistician considered some of the variables such as care, patient assignment, staffing and shift not to be independent therefore statistical tests were limited. The statistician warned that because of the nature of the data, the dependence

of variables and the size of the sample the statistical analysis and the statistical significance of findings must be viewed with caution. It is accepted by the statisticians, that a descriptive study of this nature can be undertaken and the importance of findings demonstrated, without statistical testing.

(iii) Where appropriate, various statistical tests have been used on the data. When statistical analysis has been employed the type of test undertaken has been mentioned. The statistical findings have been included in order to validate the research findings in both a descriptive and scientific manner.

7.2.12 IMPLEMENTATION OF THE CONCURRENT AUDIT (Vide p71)

a. THE CONSIDERATION OF RESEARCH VARIABLES

Prior to the implementation of the concurrent audit variables that may have affected data collection and/or the results of the research, directly or indirectly, needed to be considered:

(i) The patient

20 cases were selected according to the selection criteria (vide p122/123).

(ii) Area

The trauma unit (general surgical unit) (vide p121).

(iii) Cubicle

TABLE 4:42

Cubicle size and patient dependency

Cubicle name	Cubicle size	Patient dependency
A	1 x 4 bedded	High care
B/C/D	3 x 6 bedded	Intermediate care
E/F	2 x 2 bedded	Low care
G/H	2 x 1 bedded	Low care
TOTAL	28	

Progressive nursing care was practiced in The Hospital. The unit was divided into eight cubicles. Irrespective of cubicle placement, the care received by the head injured patient could be observed.

(iv) **Staff**

Staff allocation and work assignment

A central allocations department calculated the staff allocation per month. The nursing staff establishment included professional nurses, student nurses, nursing assistants and nurse aids. The professional nurse-in-charge calculated the on-duties of the staff members in the ward, on a monthly basis, in conjunction with the allocation department and members of staff. The professional nurse-in-charge of each shift assigned the work allocation to the staff present on a particular shift. Nursing assignment included total patient care, functional and general assignment.

In order to assess the quality of patient care objectively and accurately, no changes or modifications were made in the ward staff allocation or work assignment. Thus a staff member could care for more than one patient included in the study provided that he/she was allocated to care for the patient being observed.

Staff shift

Problems of only observing one shift can lead to bias in the results. The staff duties in The Hospital were based on the following six hour shifts:

07h00 - 13h00

13h00 - 19h00

19h00 - 01h00

01h00 - 07h00

Variations such as 07h00 - 19h00 and 19h00 - 07h00 existed.

TABLE 4:43

The number of times each shift was utilized to observe patients

Shift	Number of times	Time of day
07h00 - 13h00	5	Day
13h00 - 19h00	5	Day
19h00 - 01h00	5	Night
01h00 - 07h00	5	Night

(v) **Day of the week**

All days of the week were included in the research project although the availability of cases dictated the selection of the observation period.

(vi) **Months of the year**

The months of the year could not be controlled as the researcher employed consecutive sampling. Based on the epidemiological survey the researcher envisaged that four or five cases would be selected per month.

(vii) **The observer/s (rater/s)**

It is important to consider the variable 'observer' from two aspects in particular, namely:

Selection of observers

No quality assurance programme such as this has been conducted in The Hospital. The nature of the study precluded the use of registered nurses in clinical practice in The Hospital. The observations were performed by the researcher and three other co-raters, who were nurse educators involved in nurse training and clinical practice in The Hospital. Therefore all observers were familiar with the standing orders and policies of The Hospital. During the period of the study none of the observers were involved in teaching in the trauma unit of The Hospital.

TABLE 4:44

Summary of the qualifications of the observers

Qualifications	No. of raters* (N=4)
B.So (Nursing)	2
M. Cur.	1
B. Cur.	1
Dip. Nursing Education	4
Dip. Midwifery	4
Dip. Intensive Nursing	2
Dip. Operating Theatre Technique	1
Dip. Nursing Administration	2
Dip. Community Health Nursing Science	1
Certificate Neuromedical and Neurosurgical Nursing	1

*All raters had at least six years post-registration nursing experience.

As the criteria and standards of practice are specified, rater ability and objectivity should not be affected by the experience and qualification of the observers.

To maintain continuity the researcher observed all 20 cases. To ensure objectivity of the researcher, as a means of quality control, five cases (25 percent) were observed by the researcher and one co-rater, who without consultation completed their own set of

schedules. Due to the difficulty of obtaining co-raters (as finance was not available) all co-raters conducted their periods of observation during the latter half of the study. The co-raters observed the care received by cases number 17 (Co-rater 1), 15, 19 (Co-rater 2), 18, 20 (Co-rater 3). For the purpose of data storage each rater carries a computer code.

The presence of the observer

To avoid confusion observers were not identified in uniform. The role of the observer/s in care was that of non-participant observer (APPENDIX M).

In the light of some of the comments passed, the presence of the observer/s, was not regarded as a variable that would affect the quality of care received or the results of the research (vide p390).

b. THE INTRODUCTION OF THE STUDY TO UNIT STAFF, PATIENTS AND SIGNIFICANT OTHERS

(i) Nursing personnel

All nursing personnel working in the unit were personally invited to a meeting held by the researcher in May, 1982 to discuss the proposed study. On the 10th September, 1983 the senior professional nurse-in-charge of the unit was sent a letter (APPENDIX N1, N2) informing her and her personnel of the pending research. The researcher visited the unit to discuss the proposed research with the personnel. In the letter and during the discussion, the researcher stated the following:

(i) The purpose of the research was to examine:

- The recovery and rehabilitation of moderately and severely head injured patients. No further definition was supplied.
- The care received by head injured patients. This was purposely not defined further. The personnel were not told and neither did they enquire as to which patient or aspects of care were being observed.

(ii) The staff were informed that this was not a merit rating system and that the results of the study would not be used for promotion or staff records. Anonymity was guaranteed.

(iii) The time span of the study.

The study was to commence on 1 November, 1983. The observer would spend a total of 120 hours undertaking non-participant observation until 20 cases had been observed. On five occasions two observers would be present.

(iv) The researcher requested that the letter sent to the senior professional nurse-in-charge be posted on the staff notice board for referral purposes.

(v) Staff were requested not to direct questions to the observer/s.

(vi) The observer/s would be seated in the cubicle where the patient was being observed and would 'mark' (√) papers.

(vii) The role of the personnel in relation to the observer:

PROFESSIONAL NURSE-IN-CHARGE OF THE SHIFT:

- To introduce the observer/s to the ward personnel on commencement of the observation period.
- To identify the patients with head injuries.
- To assist the researcher to complete the situational analysis data sheet.
- To allow the observer/s access to the patient's records.

WARD STAFF:

- To continue their normal activities and disregard the presence of the observer.

(ii) The patient and significant others

On commencement of the observation period the observer/s introduced themselves to:

- All the patients in the cubicle.
- Significant others visiting the patient under study.

A formal letter of introduction verifying the research and requesting permission to include the patient in the research was handed to a family member or friend (APPENDIX E4, E5). If relatives did not visit the patient during the observation period, on completion of the observation, a sealed envelope containing the letter and form, was given to the charge nurse for distribution to the patient's relatives. Replies were collected from the unit by the researcher.

c. IMPLEMENTATION OF THE OBSERVATION PERIOD

(i) Length of observation period

Six hours per patient.

(ii) Number of patients to be observed per observation period

One.

Due to environmental factors such as cubicle allocation, staff allocation and patient assignment the observation of more than one patient at a time was not possible. The situational analysis, the number of data sheets and schedule detail that needed to be completed per patient also precluded the observation of more than one patient.

(iii) **The selection of cases**

Consecutive sampling commencing on 1 November, 1983 was employed. Methods used to notify the researcher that head injured patients had been admitted to the unit:

- The trauma house officer, professional nurse or ward clerk notified the researcher telephonically.
- The researcher telephoned the unit twice daily (08h00 and 20h00) to ascertain if any patients had been admitted.
- The researcher visited the trauma unit at least every second day (vide p486).

In the event that a head injured patient had been admitted:

- A brief history was obtained to assess inclusion criteria (vide p122).
- The shift for observation was decided upon. The shift after notification was used for the period of observation. In the event that this shift had already been completed the following shift was utilized.
- The co-rater was notified.
- Pre-packed research files were obtained.
- The observer/s arrived in the unit 15 minutes prior to the commencement of the concurrent audit in order to listen to report and complete the situational analysis data sheet.

7.2.13 THE QUALITY ASSURANCE MODULE

Prior to completing the quality assurance study, because of the nature of the study and the need for the schedules to be particular to The Hospital, the discussion of the modalities of care to be examined was limited (vide p152). Thereafter international and national experts were consulted.

THE PURPOSE OF ISSUING THE MODULE

To obtain objective evaluation of the quality assurance module.

MODULE DESIGN

On completion of the quality assurance study the quality assurance module consisting of a comprehensive set of research instruments used to evaluate the quality of care, were collated and issued to nursing experts internationally and nationally.

The module contained the following instruments of the study:

(i) An explanation of the use and scoring of the schedules (APPENDIX P).

(ii) The 27 schedules (APPENDIX I1-27).

(iii) An example of a practice guide (APPENDIX J 10).

THE SAMPLE

The sample included four categories of registered nurses:

(i) Nursing experts, internationally and nationally, who are well versed in quality assurance to evaluate the structure, design and content of the research instruments.

(ii) Neurosurgical nursing experts, internationally and nationally, who possess specialist neurosurgical knowledge and practical expertise to evaluate the content of the quality assurance schedules in relation to the management of the head injured patient.

(iii) Registered nurses in clinical practice associated with The Hospital either as Nursing Service Managers, nurse educators or unit staff.

(iv) A quality assurance module was directed to each of the 50 Directors of Nursing Services, associated with all the institutions internationally and nationally, that received questionnaires regarding head injury facilities.

DISTRIBUTION OF THE QUALITY ASSURANCE MODULE

A covering letter explaining the purpose of the quality assurance module was enclosed (APPENDIX O1, O2, 03). The quality assurance modules were distributed by one of the following means:

(i) Direct mailing.

(ii) Indirect mailing:

- Where hospital protocol dictated that all correspondence for staff employed by that institution be directed through the office of the superintendent.
- The covering letter of the 'FACILITIES QUESTIONNAIRE'S' requested the respondent to forward the quality assurance module to the appropriate person (APPENDIX C6, C7,C8).

7.3 ASSESSMENT OF KNOWLEDGE AND CLINICAL EXPERIENCE OF UNIT STAFF

7.3.1 UNIT PERSONNEL QUESTIONNAIRES

The educational level, knowledge and practical expertise of the staff in the unit who were involved in the comprehensive care of the head injured patient were ascertained.

PURPOSE

To assess the following in relation to st..ff caring for head injured patients:
Professional qualifications;
The knowledge level;
The level of practical expertise;
The learning needs of staff members.
To determine the opinions of the staff, in relation to the rehabilitation of the head injured patient.
To correlate staff knowledge and the care received by head injured patients.

RESEARCH TECHNIQUE

Questionnaire.
Two questionnaires were compiled:
NURSING PERSONNEL (APPENDIX Q 1).
MEDICAL/PARAMEDICAL PERSONNEL (APPENDIX Q 2).

The number and location of the respondents and the information sought favoured the questionnaire technique.

INSTRUMENT DESIGN

As the two questionnaires are similar they are presented simultaneously. The nursing personnel and medical/paramedical questionnaires contain 34 and 29 questions respectively incorporating both 'open-ended' and 'closed' type questions relating to the educational level, knowledge and practical experience of nursing, medical and allied health personnel. (Read in conjunction with APPENDIX Q1, Q2). All items are self-explanatory.

TABLE 4:45

The design of the unit personnel questionnaires

Question number	Information sought
1	Identifying data.
2 - 3	Qualifications.
4	Educational level.
5	Clinical experience.
6	Ward teaching.
7	Team involvement.
	Level of knowledge regarding:
8	Intracranial pressure.
9	Observations.
10	Management.
11	Facilities.
12 - 13	Miscellaneous.

SAMPLE

Questionnaires were issued to all nursing, medical and allied health personnel working in the trauma unit during the period 1 November, 1983 - 30 April, 1984.

DISTRIBUTION OF QUESTIONNAIRES

In order to avoid influencing the results of the quality assurance study, questionnaires were issued in May, 1984 for return by 30 June, 1984. The questionnaires, a covering letter (APPENDIX Q3, Q4) and stamped, addressed envelopes were:

1. Distributed by hand to all nursing staff respondents. In the event that this was not possible (staff member on leave/resigned), the questionnaire was mailed to the forwarding address, as supplied by The Hospital's staff office.
2. Mailed to medical and paramedical (allied health) personnel respondents.

In October, 1984 the questionnaires were redistributed by mail to those respondents who had not replied with a request for the return of the information by 20th December, 1984.

7.3.2 ASSESSMENT OF THE EDUCATION OF STUDENT NURSES

PURPOSE

To assess:

Student Nurse education at the Nursing College attached to The Hospital.

The content of the curriculum and syllabus in relation to disorders of the central nervous system.

Teaching strategies.

Lecturer qualification.

RESEARCH TECHNIQUE

Questionnaire

INSTRUMENT DESIGN

The mailed questionnaire (APPENDIX Q5) contains six items relating to the education of Student Nurses. All items are self-explanatory.

TABLE 4:46

The design of the questionnaire: Education of Student Nurses

Item number	Information requested
1	Number of lectures.
2	Active participation of students.
3	Teaching strategies.
4	Course content.
5	Lecturer qualifications.
6	Additional comment.

DISTRIBUTION OF THE QUESTIONNAIRE

The questionnaire was sent to the Principal of the Nursing College in a stamped self-addressed envelope (APPENDIX Q6).

CHAPTER 5

PRESENTATION AND DISCUSSION OF FINDINGS

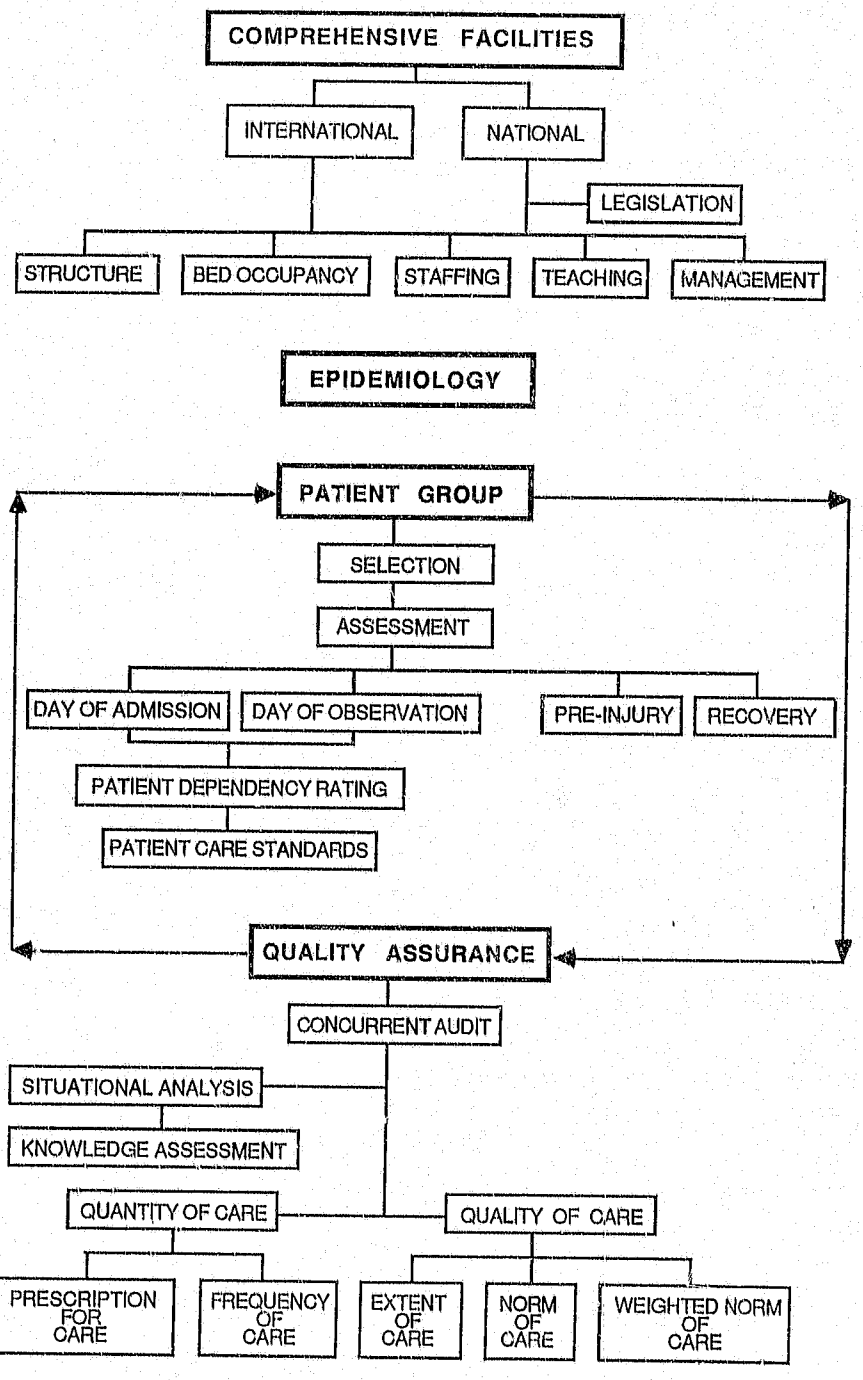


Fig. 5:1 Schematic overview of research findings

1. FACILITIES FOR THE COMPREHENSIVE CARE OF THE MODERATE AND SEVERELY HEAD INJURED PATIENT

12 letters were sent to various health authorities and associations (APPENDIX C1) concerned with the care of the disabled and numerous telephonic conversations were held.

The researcher was referred:

1. Regarding legislation to:

1.1 The Health Act No. 63 of 1977 as amended;

1.2 The Mental Health Act No. 18 of 1973 as amended by Mental Health Amendment Act No. 10 of 1978 and No. 3 of 1984.

1.3 Abuse of Dependence-producing Substances and Rehabilitation Centres Act No. 41 of 1971.

1.4 Child Care Act No. 74 of 1973.

2. The Hospital Year Book (Engelhardt, (ed.) 1984).

The only rehabilitation centres mentioned are those concerned with drug and alcohol abuse, the mentally retarded and tuberculosis sufferers. These were not considered relevant to the head injured patient per sé.

The reply to the letter to the Director-General: Department of National Health and Population Development stated:

"Since this Department is concerned with the subsidisation of local authorities for inter alia, rehabilitation in the community of persons who have recovered from and not for medical rehabilitation as such, it is suggested that you direct your enquiries to the Directors of Hospital Services of the various provincial administrations."

The letters directed to the Directors of Hospital Services in the four provincial administrations revealed the following regarding rehabilitation services:

"The nursing inspectorate does not have any regulations pertaining to rehabilitation, ..." (Natal)

"The Hospital Services Directorate of the OFS is responsible for the hospitalisation of patients and not for the rehabilitation of such patients." (Orange Free State)

No replies were received from the Directors of Hospital Services of The Transvaal and Cape Province.

DISCUSSION

The responsibility for the provision of rehabilitative health services, although vested in the Minister, appears to be divided and unco-ordinated. According to The Health Act (No. 63 of 1977:675), rehabilitation is not mentioned as a specific function of the provincial administration except in that it is responsible for the provision of hospital facilities and services. It appears that provincial administration is responsible for curative services in so far as the provision of 'personal health services' (The Health Act No. 63 of 1977: 677). Rehabilitation appears to be divided into community and medical rehabilitation. It appears that local authority is responsible for community rehabilitation. Who then is responsible for medical rehabilitation - the care of the patient until a 'cure' has been obtained? Surely this is included in the general term "provision of hospital facilities and services"? (The Health Act No. 63 of 1977: 675). The Guide to the Health Act (1978:46) states:

"Although not specifically mentioned, medical rehabilitation forms part of a personal health service, and in terms of the Act it can readily be expected that such services will be provided by the provincial administration ... ".

Thus there is a dearth of specific legislation relating to the comprehensive care, including the rehabilitation of head injured patients. Attempts to establish who is responsible for providing rehabilitation services have failed. A commission of enquiry into rehabilitation in South Africa was established in 1976 (Departement van Gesondheid, 1976). Little progress has been made regarding rehabilitation in the last 10 years. Legislation regarding rehabilitation in South Africa needs to be formulated and adequate co-ordinated comprehensive rehabilitation facilities that promote maximum physical, psychosocial, emotional, educational and economic well-being of the patient must be established.

1.1 AN OVERVIEW OF FACILITIES AVAILABLE FOR THE COMPREHENSIVE MANAGEMENT OF HEAD INJURED PATIENTS

A total of 50 questionnaires were issued to institutions internationally and nationally .

TABLE 5:1

Distribution of questionnaires

Country	Number	
	Issued	Replied
S.A.	25	13
U.K.	15	11
U.S.A.	10	1

The percentage return was 50 percent (25) although only 20 percent (11) completed the relevant questionnaires.

Of those who replied four (U.K.) stated that the questionnaires would be returned in due course yet after several enquiries by the researcher nothing materialised. 10 respondents stated that they could not participate in the study. Examples of reasons for not participating in the study follow:

1. The respondent believed this study should be conducted locally and not nationally (S.A.).
2. The staff shortage and therefore the staff could not be loaded by asking them to complete the questionnaire/s (S.A./U.K.).
3. The questionnaire/s were too lengthy and too detailed.
4. The institution did not treat head injuries (although one of the patients in the study was transferred to the said institution) (S.A.).
5. The rehabilitation programme was a home programme (U.S.A).

11 respondents completed the questionnaires. Of these, four of the respondents completed the sections relating to the medical/paramedical care of the patient but failed to complete the section related to nursing. For the purpose of the discussion each institution has been allocated a number (1-5, International / 6-11, South Africa).

As few institutions responded to the questionnaire the results must be viewed with caution. The responses have been summarised and will be considered in relation to the recommendations (vide p406).

1.1.1 HEAD INJURY UNIT

A comprehensive, co-ordinated head injury unit existed at three institutions. There was no comprehensive head injury unit at eight institutions. Although only three institutions had specific head injury units the discussion continues in relation to all the units caring for head injured patients. For ease of discussion hereafter the units are refered to as head injury units. (One respondent (No. 11, S.A.) merely stated that there was no head injury unit, no further information was recorded. Seven institutions stated that there were no other comprehensive head injury units within a 50 km radius. Three stated that there were three to six district/general hospitals that cared for head injured patients within the radius.

ADMISSION OF HEAD INJURED PATIENTS

Head injured patients were admitted to various units.

TABLE 5:2

Type of unit

Type of unit	No. of Institutions (N=10)
Neurosurgical unit	4
Traumatology unit	2
Surgical unit	2
Neurosurgical intensive care unit	1
General surgical intensive care	1

Unit size

TABLE 5:3

Sub-division of unit for bed allocation

Institution number	Location	Total number of beds	No sub-division of beds	Progressive nursing system	Dependency of patients			
					High	Intermediate	Low	Mobile
1	UK	67	-	-	5	12	40	-
2	UK	20	X	-	6	14	-	-
3	UK	16	-	-	-	-	-	-
4	UK	100	-	-	11	80	9	-
5	UK	40	-	X	-	-	-	-
6	SA	30	X	-	-	-	-	-
7	SA	6	-	X	-	-	-	-
8	SA	12	-	-	4	4	2	2
9	SA	100	X	-	-	-	-	-
10	SA	28	-	X	4	-	-	-
11*	SA	N/S	-	-	-	-	-	-

*No information furnished here-after.

The size of the unit varied at the different institutions. Some were 'Nightingale' type units, others were divided into one, two, four and six-bedded units and yet others operated on a progressive nursing system basis.

Bed differentiation

There was no differentiation of beds by sex at four institutions;
Five institutions allowed for a male:female ratio of 50 percent;
One institution allowed a male:female ratio of 75:25 percent.

Number of head injured patients admitted

TABLE 5:4

The average number of head injured patients admitted to the unit per month, per institution

Institution number	Number of head injured patients admitted	Average length of stay	Bed occupancy (%)
1	Minor: 120 Major: 6	25-96hrs	70
2	150	72hrs-14 days	90
3	1-2	8-14 days	85-90
4	50	5-7 days	80
5	-	-	-
6	-	-	-
7	51	-	83
8	10-20	72hrs-14 days	70

The number of head injured patients admitted per month varied according to the institution.

STAFFING ESTABLISHMENT

Staff establishment varied per institution according to the number of beds in the unit.

The staff: patient: student ratio varied per institution.
The recommended ratio of trained staff to patient:
One or two registered nurses: one patient in the acute phase, particularly if the patient has multiple trauma (U.K.).
One staff member (registered/ non-registered): one patient (S.A.).

Health team

Five unit health teams met at least once per day to discuss the patient's progress;
Two met twice per day;
Three met once per week;
Two institutions stated that over and above the multidisciplinary meeting the nursing and allied health personnel met daily.
Eight institutions stated that the meeting took place in an informal setting;
Two institutions stated that the meeting took place in a formal setting.
Methods of presentation at meetings included ward rounds (eight), case presentation (one) and a mixture of both (one).

A therapeutic support system for staff was available at two institutions. In both institutions the person-in-charge of the support system was a psychologist and/or social worker.

Nursing staff

TABLE 5:5

Summary of the post-registration professional qualifications of the nursing staff in the unit, per institution

Institution number	Total number of nursing staff	Post-registration qualification		
		Neurosurgical nursing	Intensive nursing	Total
1	14	1	1	2
2	21	2	1	3
3	30	4	-	4
4	28	0	0	0
5	N/S	10	2	12
6	N/S	-	-	-
7 Acute	18	0	9	9
Sub-acute	19	0	5	5
8	12	0	0	0
9	44	0	1	1
10	27	0	1	1

Key: N/S = Not stated

The number of nursing staff in the unit who had post-registration neurosurgical nursing or intensive nursing specialisations varied from institution to institution. Very few professional nurses were in possession of a post-registration qualification.

Student nurses

Nursing students were allocated to the head injury unit at seven institutions.

TABLE 5:6

The grade of nursing students allocated to the unit

Grade of nursing student	No. of Institutions (N=7)
Post-graduate student	1
Post-basic student	6
Undergraduate student	5
Basic student	6

TABLE 5:7

The status of nursing students in the unit

Student status	No. of Institutions (N=7)
Supernumerary status	2
Learning experience only	2
Work force	3

The basic nursing students were assigned to the unit throughout the three years of study, thus junior staff could be allocated to the unit.

Evaluation of staff performance

TABLE 5:8

Methods of evaluation employed to assess the quality of care in the unit

Methods of evaluation	Trained staff (N=10)	Student Nurses (N=7)
Assessment forms	1	4
Care plans	1	1
Confidential reports	2	1
Merit rating system	1	1
Nursing process	1	1
Patient audit	1	1
Performance appraisal	1	1
Theoretical tests	1	1
Ward inspection	1	1
Ward rounds	1	1
Not stated	4	4

Many institutions used more than one method of evaluating the quality of care.
Three institutions utilized quality assurance programmes to evaluate the care of head injured patients.
No mention was made of case presentation and assignments.

Staff teaching

Of the 10 respondents, formal educational programmes for the teaching of staff employed in the unit were available as follows:
Two for trained staff;
Two for student nurses;
One for trained staff and student nurses;
Five institutions did not answer this question.

Personnel responsible for organising the educational programme included:

The nursing service managers.	The clinical nurse specialist.
The faculty member.	The clinical tutor.
The nursing studies unit.	The ward sister.

The clinical teaching and in-service education department.

TABLE 5:9

Personnel responsible for the teaching of Student Nurses in the unit

Category of personnel	No. of institutions (N=7)
Ward sister	4
Clinical tutor	3
Faculty member	1
Service manager	1
Team members	2
Not stated	3

As part of the learning process Student Nurses were expected to participate in hand-over. None of the following learning activities were mentioned with regard to active participation of the Student Nurse:

Case presentation.	Peer teaching.
Demonstration.	Projects.
Use of library/resource centre.	Self-learning.

SHIFT

Six institutions allocated staff on an eight hour shift basis and four allocated staff on a basis of six hours or multiples there-of.
The most common shift worked was the eight hour shift.

SYSTEM OF PRACTICAL ASSIGNMENT

TABLE 5:10

System of practical assignment

Practical assignment	No. of Institutions (N=10)
Case assignment	2
Functional assignment	1
Mixed assignment*	4
Primary nursing	1
Not stated	2

* Combination of systems of practical assignments mentioned.

The most common system of practical assignment was the mixed assignment.

PATIENT MANAGEMENT

The management of the patients at the various institutions is summarised.

Protocol of management

A set protocol for the management and nursing of moderate and severely head injured patients was available at a total of four and three institutions respectively.

Prescribed care modalities

Observations

TABLE 5:11

Method of recording neurological observations

Method	No. of Institutions (N=10)
Glasgow Coma Scale	8
Not stated	2

The Glasgow Coma Scale was used most frequently to record level of consciousness.

Only three institutions responded to the question regarding the frequency of performing neurological observations. The frequency of performance of observations varied from every 15 - 60 minutes for the first 72 hours, then one to two hourly progressing to four to six hourly after seven days according to the condition of the patient.

One institution stated that barbiturate therapy was not employed and another stated that all ventilated patients were admitted to the intensive care area. Intracranial pressure monitoring was utilized by four institutions for all cases, by three institutions in some cases and was not used in two institutions.

TABLE 5:12

The frequency of nursing care prescribed for a patient with a severe head injury (G.C.S. ≤8/15)

Modality of care	Frequency (Hourly)	No. of Institutions (N=10)
Eye care	2	5
	3	1
	4	3
Not stated	*	1
Oropharyngeal care	1-2	5
	3	1
	4	2
Not stated	*	2
Bronchial toilet	1	2
	2	5
	3	1
	4	1
Not stated	*	1
Urogenital care	4	3
	6	2
Not stated	*	5
Change of position	1-2	6
	3	1
	4	2

Patient stimulation

Two institutions stated that no active means of stimulation was used; whereas eight institutions included all or some of the following in the patient's programme:

Dressing the patient.
Getting the patient out of bed.
Involving family members.
Talking to the patient.
Touch.
Use of ice.

Oral fluid administration.
Smell.
Sound.
Use of games.
Use of radio.
Use of television.
Use of tape recorder-messages from family members, music.

Family participation

Contact with the family was maintained mainly by the medical, nursing, allied health personnel, the multidisciplinary team and by HEADWAY (The National Head Injuries Association, U.K.). The consultant, nurse and multidisciplinary team explained the patient's condition to the family most frequently.

At six institutions, a therapeutic support group run by the social worker, psychologist, nurse and/or HEADWAY was available.

The medical, nursing and paramedical personnel prepared the family for the patient's discharge by:

Allowing unrestricted visiting by the family.
Encouraging family participation.
Case conferences.
Formal discussion.
Home visits.
Informal discussion.

At one institution prior to discharge the head injured patient was automatically assessed by all the relevant health professionals;
At three institutions by most of the health professionals;
At three institutions by the physiotherapist and social worker only;
At two institutions no assessment prior to discharge was undertaken.
One institution failed to complete this question.

TABLE 5:13

Discharge assessment performed by health professionals

Health professional	No. of institutions (N=10)
Community nurse	1
Neuropsychologist	3
Occupational therapist	5
Physiotherapist	9
Psychologist	3
Remedial gymnast	2
Social worker	7
Speech therapist	4
Not stated	1

It is interesting to note that on discharge the neurosurgical nurse did not complete an assessment for follow-up as part of the nursing process.

FINANCIAL IMPLICATIONS

The financing of all the head injury units was obtained from government funds. The cost per patient, per day in the unit was known by three respondents only and varied according to the health service and the unit.

A rehabilitation unit was attached to four institutions whereas no rehabilitation unit was attached to six institutions.

DISCUSSION

A comprehensive co-ordinated facility was the most favoured means of caring for head injured patients. There was no uniformity in the design and size of the units catering for head injured patients. This varied according to the policy and structure of the larger institution and the size of the catchment area where the head injury unit was established.

There is no universally accepted method of staffing a head injury unit. The method used was determined by institutional policy and various other factors. As patient dependency increases, the staff ratio should increase proportionately. One institution had a unit of 100 beds and a total of 44 staff members. Both quantity and quality of staff must be considered. The educational qualifications of the staff employed in the unit changed from unit to unit. It appears that further specialisation was not a pre-requisite to working in all head injury units. Formal educational programmes are necessary to assist service managers to maintain standards of practice and should be available in all units. In units where nursing students are part of the work force, the trained staff ratio should be increased to cope with the additional responsibility, supervision, teaching and evaluation of the learners.

The various methods of patient assignment may promote or hamper communication with the patient and family. Primary nursing enhances communication; whereas functional assignment is task not patient orientated. There is no uniform method of managing head injured patients. To obviate time wastage and maintain excellence in

set protocols of management should be available. This protocol with stated objectives and modalities of care will permit staff to offer a standardised quality service and allow for evaluation of the care (APPENDIX T).

Most units utilized the Glasgow Coma Scale to record level of consciousness. Modalities of care practiced included intracranial pressure monitoring, basic nursing care and some informal and formal means of stimulation. A multidisciplinary approach to head injury patient management is essential. Therapeutic support groups for staff, patients and families run by a nurse, social worker and/or psychologist should be available in all head injury units.

1.1.2 REHABILITATION FACILITIES

Comprehensive co-ordinated rehabilitation units existed at four institutions (three in U.K./one in S.A.), no such unit existed at seven institutions (vide p207).

a. REHABILITATION FACILITY AVAILABLE

TABLE 5:14

Type of facilities where head injured patients were admitted for rehabilitation purposes

Type of facility	No. of institutions (N=11)
Specific head injury rehabilitation centre	0
Neurological rehabilitation centre	1
Mixed	3
No rehabilitation centre	7*

* 1 respondent (S.A.) stated that there was no rehabilitation centre and then failed to complete questionnaire IIB.

The one hospital (U.K.) stated that it was a co-ordinated neurological centre with a rehabilitation team but no rehabilitation centre as such, as the rehabilitation centres were in the peripheral hospitals.

Two respondents stated that the number of rehabilitation beds that were available per institution were 28 (Instit. No. 2) and 24 (Instit. No. 3) respectively. The other respondents failed to answer this question.

Of the four rehabilitation centres:

There was no differentiation of beds, by sex, at the two institutions;

One institution allowed for 14 male and 14 female patients at any one time;

At one institution, only a maximum of five head injured patients were permitted in the unit at one time.

TABLE 5:15

Facilities that were available at the rehabilitation centres

Facilities	No. of institutions (N=4)
Live-in facilities	3
Out-patient facilities	3
Day centre	3

Two institutions stated that there were and two stated that there were no other head injury rehabilitation centres within a 50km radius.

Admission of head injured patients to the rehabilitation facility

Criteria for admission to the four rehabilitation facilities included:

Ability to obey instructions.	Stable medical/surgical condition.
Ability to walk with aid if necessary.	Survival from severe head injury.
Independent regarding dressing and feeding.	Discussion with team.
No wound care.	Priority to hospital's own patients.
Patient continent of urine and faeces.	Referral by neurosurgeon.

Severe disability but more than persistent vegetative state.

Prior to admission, all the patients were seen by a medical officer but no multidisciplinary or nursing assessment was undertaken.

TABLE 5:16

The average number of live-in head injured patients admitted to the centre per month, per institution

Institution number	Number of patients		Length of stay	Bed occupancy (%)
	General	Head injury		
2	8	4	6-12 weeks	85
3	17	1	3- 6 weeks	54
4*	N/A	-	-	-
	-	-	7 weeks	-

* No live-in facilities were available at this institution.

Length of stay in rehabilitation facility

According to the information received, the average duration of treatment in the live-in facility, out-patient facility and day centre was three to 12 weeks, two years and six months respectively.

STAFFING OF THE REHABILITATION FACILITY

Multidisciplinary team approach

Therapies for the comprehensive rehabilitation of the patient were available.

TABLE 5:17

Professional services that were available at the rehabilitation facilities

Professional services	No. of institutions (N=4)
Occupational therapy	4
Physiotherapy	4
Psychological services	4
Remedial gymnastics	3
Social worker	4
Speech therapy	3
Work assessment	3

TABLE 5:18

Assessment of the patient on admission to and at discharge from the rehabilitation facilities, by the various health professionals

Type of assessment	Number of institutions	
	On admission (N=4)	On discharge (N=4)
Exercise physiologist	1	1
Occupational therapy	4	4
Neuropsychological	0	0
Nursing	4	4
Nutritional therapy	1	1 prn
Physiotherapy	4	4
Psychiatrist/psychological	1	2
Remedial gymnast	2	2
Social work	3	4
Speech therapy	3 + 1 prn	2 + 2 prn

Frequency of meeting

At two institutions the unit health team met once per week to discuss the patient's progress;

At one institution they met once every two weeks and at the other they met on request only.

The allied health personnel and nursing staff in one institution met once per day to discuss the patient's progress.

In three institutions the meeting was held in a formal setting and in one institution the meeting was held in an informal setting.

Case presentation (four institutions), discussion (three institutions) and ward rounds (one institution) were the forms of contact used.

A therapeutic support system for staff was available at all four institutions. The person/s-in-charge of the support system included the nursing service manager, social worker, psychologist, minister of religion and psychiatrist.

TABLE 5:19

Staff establishment

Institution number	Medical staff	Nursing staff*					Paramedical staff*					
		SPN	PN	EN	ST/N	N/A	OT	Phys	Psy	R.G.	SW	ST
2	4F 1P	2F	2F 1P			2F 2P	2F	2F	2P		1P	1F
3	1P	2F	3F	5F		3F	3F	3F			1P	1
5	N/A			N/A			√ N/S	5F 2P		3F		
6	N/S			N/S				N/S				

Key: F = full-time P = part-time * See list of abbreviations page(iv) N/S = Not stated

Nursing staff

Two respondents answered the question regarding post-registration qualifications of the registered nurses:

One of the registered nurses had a post-registration qualification in intensive nursing (Instit. No. 2).

No staff had the additional qualifications (Instit. No. 3).

Students

Post-basic nursing students were allocated to the head injury rehabilitation centre in two institutions; their status being supernumerary. In one other, nursing students were only permitted to visit the unit.

Nursing staff education

In two institutions formal educational programmes organised by the following personnel were available for trained staff:
Faculty member;
Nursing studies unit;
Rehabilitation studies unit.

Methods of evaluation employed to assess the quality of care of trained staff in the unit included:
Care plan evaluation;
Merit rating;
Performance appraisal.

Post-basic nursing students in the three units were taught by the clinical sister and nursing staff. As part of the learning process the students were expected to participate in discussion. The only active participation for post-basic students of the one institution was to prepare work for the study day, on a day release system.

SHIFT

The most common shift worked was the eight hour shift (two institutions);
One unit worked seven hour shifts and in the other the shift worked varied.

The trained staff : student : patient ratio

The trained staff: student: patient ratio varied per institution.
The respondents regarded the ideal trained staff : student : patient ratio per shift as one:one:three.

SYSTEM OF PRACTICAL ASSIGNMENT

TABLE 5:20

Systems of practical assignment employed

Practical assignment	No. of institutions (N=4)
Primary nursing	1
Case assignment	1
Mixed assignment	1
Not applicable	1*

* This institution had no live-in facility.

THE ROLE OF THE NURSE IN THE REHABILITATION SETTING AS SUPPLIED BY THE FOUR INSTITUTIONS IS SUMMARISED AS FOLLOWS:

Counselling.

Ensuring that the patient is safe to be discharged home.

Maintaining the activities of other health personnel.

Maximising ability to return to work.

Monitoring patient status.

Patient care.

Patient discipline.

Preparation of the patient for integration.

Teaching the patient and the family.

MANAGEMENT OF THE HEAD INJURED PATIENT

One institution used a quality assurance programme to evaluate the care of the head injured patients.

A set protocol of management of the head injured patient admitted to the rehabilitation facility was available at one institution.

A medical practitioner was in charge of the four rehabilitation facilities. The patient's rehabilitation programme was planned by the consultant in rehabilitation medicine (one) and the multidisciplinary team (three). The daily programme of the patient, was according to the individual needs of the patient, consisting of 45-60 minute sessions.

Methods of stimulation employed in the rehabilitation facilities included:

Arts and crafts.	Metalwork.
Auditory stimulation.	Newspaper quizzes.
Comprehension tests.	Physical therapy.
Concentration and memory exercises.	Pottery.
Encouraging swallowing.	Puzzles.
Family contact.	Visual perception.
Food.	Woodwork
Ice for tactile stimulation.	Video playback of patient's condition.

Family participation

Contact with the family was maintained most frequently by medical and nursing personnel and the social worker. The medical, nursing and allied health personnel prepared the family for the patient's discharge by means of formal discussions (four institutions):

Assessing home circumstance (Occupational therapist and nurse).

Constant reassurance and comfort.

Family counselling.

Follow-up with social worker and psychologist for home and personal problems.

Referral to the social worker and social services such as HEADWAY.

TABLE 5:21

The family's involvement in the rehabilitation setting

Method	No. of institutions (N=4)
Counselling	3
Home visits	3
Teaching	3

At all four institutions the families were involved in the rehabilitation programme.

Prior to discharge, at all four institutions the patient was introduced gradually to the home setting.

TABLE 5:22

Methods of introducing the patient to the home setting

Method of introduction to home setting	No. of institutions (N=4)
Day visit	2
Discharge planning	1
Home visit with therapist	1
Week-end visit	4

COMMUNITY SERVICES

Those mentioned as being available to the head injured patient and family included:

Association for the physically disabled.*
Charitable institutions.
Day care centres.
Disabled workshops.
District nursing service.*
HEADWAY/HEADLINE.*
Home help.
Home nursing.
Head injury rehabilitation centre.

*The only resources mentioned by the respondents in South Africa.

FINANCIAL IMPLICATIONS

Funding for the four rehabilitation facilities was obtained from government funds. The cost per patient per day in the facility varied according to the medical insurance, income and financial status of the patient. No institutions stated the cost.

b. NO REHABILITATION FACILITY AVAILABLE

TABLE 5:23

Reasons cited for the lack of co-ordinated rehabilitation facilities

Reason	No. of institutions (N=6)
The hospital is an acute hospital	4
The hospital is a chronic sick unit	1
Refusal by the government to provide funding	1

Seven institutions stated that no rehabilitation facilities were available:
One institution failed to complete the remainder of the questionnaire.

Five institutions stated that rehabilitation commences on admission to the head injury unit;
One superintendent answered the question by stating 'Is this a fair question what do you think?.

Three institutions stated that it was the responsibility of the government to provide rehabilitation facilities. One respondent (S.A.) added the following comment

"Rehabilitation ideally needs to be organised on a regional basis designated by natural barriers rather than artificially created borders."

Three believed it to be a shared responsibility. One stated that the insurance companies should become involved in setting up rehabilitation facilities;
Three institutions stated they were endeavouring to establish rehabilitation facilities.

TABLE 5:24

The placement of the head injured patient on discharge from the acute setting

Severity of injury	Placement	No. of institutions (N=6)
Minor concussions	Sent home or to referring hospitals Not applicable*	5 1
Moderate/severe head injuries	Geriatric institution Long term facility Outlying hospital Own home Rehabilitation unit	2 2 1 1 1

* One institution is a long term facility and does not accept minor concussions.

TABLE 5:25

The assessment of the patient prior to discharge from the acute setting

Health personnel	Number of institutions	
	Formal assesment undertaken (N=6)	Written report submitted to transferring hospital (N=6)
Neuro-nurse consultant	0	0
Occupational therapist	4	1
Physiotherapist	6	6
Psychologist	2	1
Rehabilitation liaison officer	1	1
Social worker	6	4
Speech therapist	3	2

Advice concerning the following was given to the family prior to discharge:
Instructions regarding abilities, aids to daily living, medication and out-patient appointments.
Advice and counselling by social worker.
Consultation with team.
Full explanation of prognosis.
General practitioner contacted.
Referral to HEADWAY.

One respondent (S.A.) stated that no specific advice was given 'as patients have sufficient insight'.

TABLE 5:26

The availability of rehabilitation services in the acute setting

Service available	As in-patient (N=6)	As out-patient (N=6)
Neuro-nurse consultant	0	0
Occupational therapy	5	3
Physiotherapist	6	4
Psychologist	4	3
Rehabilitation liaison officer	1	0
Social worker	6	4
Speech therapy	3	3

Institutions where no co-ordinated rehabilitation facility existed were able to offer some rehabilitative services to head injured patients; more services being available for hospitalised than out-patients.

The programme of patients attending the out-patient service was co-ordinated by the consultant (two institutions), the multidisciplinary team (two institutions) and the occupational therapist (one institution). In one institution the programme was not co-ordinated. The staff treating the patient on an out-patient basis met to discuss the patient's progress once per week (two institutions) or when necessary (two institutions).

DISCUSSION

The afore-mentioned is a summary of the responses. As the respondents were from various countries and there were only four respondents with head injury rehabilitation facilities the discussion is limited.

It is obvious that the problem of inadequate facilities for head injured patients is not limited to Johannesburg, South Africa but a national and international occurrence that requires urgent attention (vide p89/90). However more so in South Africa comprehensive co-ordinated rehabilitation facilities for the care of moderate and severely head injured patients are lacking (vide p188). With reference to the comment stating that no advice is given because patients have sufficient insight (vide p209) the researcher recommends the introduction of educational programmes to inform personnel of the needs of the head injured patient and family.

2. EPIDEMIOLOGICAL FINDINGS RELATING TO HEAD INJURY

2.1 EPIDEMIOLOGY OF HEAD INJURIES

INTRODUCTION

The study was undertaken in the trauma unit (general surgical ward) of a large academic institution in Johannesburg, South Africa over a period of 18 months from 1 November, 1982 - 31st April, 1984.

Head injured patients at The Hospital were admitted to the following areas, depending on the availability of beds and the severity of the injury:
The trauma unit.
The surgical intensive care unit.
The neurosurgical unit (seldom).

METHODOLOGY

The purpose of this epidemiological study was to determine the following in relation to the head injured patient population admitted to the trauma unit:

1. The age and sex distribution of head injured patients.
2. The causes of head injury with a view to preventive, promotive, curative and rehabilitative health care and education.
3. The severity of the head injury.
4. The mode of admission and discharge of the head injured patients.
5. The length of stay in the trauma unit.

THE SAMPLE

The sample comprised of all head injured patients admitted and entered in the 'Patients Admission Register' of the trauma unit. A total of 729 white head injured patients were included in this study.

DATA COLLECTION

A retrospective audit was undertaken. Information was obtained from the 'Patients Admission Register.' Where complete information for 87.93 percent of the sample (641) was not available, the patient's microfiche was obtained from The Hospital records department. Further information relating to 3.16 percent (23) could not be traced due to the omission of the patients registration number and/or birth date.

The tool used to collect the data (APPENDIX D) has been described in detail in the methodology (vide p119).

ANALYSIS OF DATA

Manual analysis was used to collate the data.
'NOT STATED' cases have been excluded when calculating results.

PRESENTATION OF RESULTS

SEX DISTRIBUTION OF PATIENTS

TABLE 5:27

Sex distribution of patients

Sex	Number of cases (N=726)	Percent
Male	573	78.93
Female	153	21.07

Of the total sample (729) the sex of the patient was not recorded in 0.41 percent (3) of the cases. 78.93 percent (573) of all head injured victims included in the study were male, 21.07 percent (153) female.

The ratio of male to female head injury victims was:

MALE : FEMALE

573 : 153

3.7 : 1

AGE DISTRIBUTION OF PATIENTS

TABLE 5:28

Mean age of sample

Distribution	Number of cases	Mean age (years)
Male	547	33.46
Female	149	34.45
TOTAL	696	33.67

The mean age of the total sample was 33.67 years.

TABLE 5:29

Age distribution of sample

Range (years)	Total number of cases	Percent (N=696)
10-19	129	18.54
20-29	237	34.05
30-39	129	18.54
40-49	70	10.05
50-59	58	8.33
60-69	35	5.03
>70	38	5.46
TOTAL	696	100.00

The age of the patient was not recorded in 4.53 percent (33) of the total sample (729). Neither the age/s nor the sex of three cases was recorded. In 4.54 percent (26) of the males (573) age was not recorded and in 2.61 percent (4) of the females (153) age was omitted.

TABLE 5:30

Age distribution of males

Range (years)	Number of cases	Percent (N=547)
10-19	86	15.72
20-29	197	36.02
30-39	108	19.75
40-49	58	10.60
50-59	46	8.40
60-69	29	5.80
> 70	23	4.21
TOTAL	547	100.00

TABLE 5:31

Age distribution of females

Range (years)	Number of cases	Percent (N=149)
10-19	43	28.86
20-29	40	26.85
30-39	21	14.09
40-49	12	8.05
50-59	12	8.05
60-69	6	4.03
> 70	15	10.07
TOTAL	149	100.00

The mean age of the males and females was 33.46 years and 34.45 years respectively. The age range for males and females was 13 - 82 and 15 - 84 years respectively. In this series 52.59 percent (366) of the patients were less than 30 years of age. The most frequent age range of the total sample being 20 - 29 years (237) followed by 10-19 years and 30-39 years (129 each). Head injuries in males occurred most commonly in the 20 - 29 years (197) then the 30 - 39 years (108) age range; whereas for females the most common age range was 10 - 19 years (43) and then 20 - 29 years (40).

MECHANISM OF INJURY OF PATIENTS

TABLE 5:32

Mechanism of injury

Mechanism of injury	Number of cases
Motor vehicle accident	281
Motorcycle accident	118
Pedestrian vehicle accident	89
Bicycle accident	10
Falls	100
Assaults	134
Gunshot wounds	40
Sports	17
Other	16
Not stated	24
TOTAL	729

KEY	MECHANISM
	MVA = Motor vehicle accident
	MBA = Motorcycle accident
	PVA = Pedestrian vehicle accident
	B = Bicycle
	Assault
	Fall
	Gun
	Sport
	Other

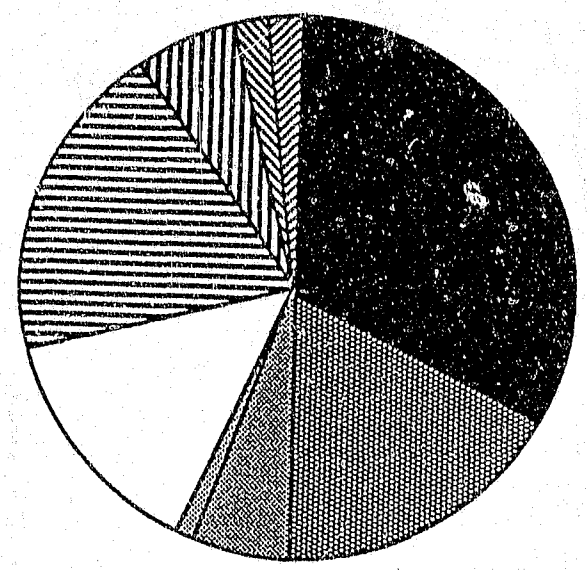


Fig 5:2 The mechanism of injury (expressed as percentages)

The mechanism of injury was not stated in 3 percent (24) of the cases. 56 percent (388) of the head injuries occurred as a result of road traffic accidents (Bicycle accidents excluded). The highest incidence (75 percent) occurred in October, 1982 and the lowest incidence (41,67 percent) in December, 1982. Falls, assaults, gunshot wounds and sports injuries were the causes of injury in 14 percent (100), 19 percent (134), 6 percent (40) and 2 percent (17) of the cases.

SEVERITY OF INJURY

TABLE 5.33

Severity of head injury on admission

Severity of head injury	Number of cases	Percent
MINOR	**333**	**45.68**
Concussion	317	95.20
Laceration of scalp	16	4.80
MORE SEVERE	**396**	**54.32**
General head injury	192	48.49
Intracranial bleed	80	20.20
Fractured base of skull	75	18.94
Fracture of vault	48	12.12
Other	1	0.25
TOTAL	729	100.00

45.68 percent of the cases (333) suffered minor head injuries and 54.32 percent (396) suffered more severe head injuries. Concussion accounted for 95.20 percent (317) of the patients with minor head injuries. General head injury, fractures of the skull and intracranial bleeding accounted for 48.49 percent (192), 31.06 percent (123) and 20.20 percent (80) of the more severely injured patients.

ASSOCIATED INJURIES

39.23 percent (286) of the head injured patients had associated injuries of the face, limbs, chest, abdomen, spine and lacerations.

ADMISSION OF HEAD INJURED PATIENTS

The head injured patients admitted to the trauma unit were under the direct care of a general surgeon. The neurosurgeons when requested by the trauma team acted as consultants.

The total number of admissions to the trauma unit over the 18 month period was 1 804 cases. Head injured patients accounted for 40.41 percent (729). In March, 1984 the highest percentage of head injuries (54.10 percent) and in February, 1983 the lowest percentage of head injuries (25.49 percent) were admitted.

ROUTE OF ADMISSION

TABLE 5:34

The route of admission of head injured patients admitted to the trauma unit

Route of admission	Number of cases	Percent (N=728)
Direct admission to trauma unit	618	84.89
Interhospital transfer	38	5.22
Intrahospital transfer	72	9.89
TOTAL	728	100.00

Of the total sample in one case (0.14 percent) the route of admission was not stated.

TABLE 5:35

Placement of the patients on discharge from the trauma unit

Outcome after head injury	Number of cases	Percent (N=721)
Refused hospital treatment	16	2.22
Direct discharge	413	57.28
Interhospital transfer	119	16.50
Rehabilitation unit	7	0.97
Intrahospital transfer	72	9.99
Organ donors	16	2.22
Deaths	78	10.82
TOTAL	721	100.00

In eight cases (1.10 percent) the place of discharge was not stated.

57.28 percent (413) were discharged home or to the care of relatives.

27.46 percent (198) were transferred to an institution. Less than 1 percent (7) of the patients were transferred to a rehabilitation unit.

The mortality rate for head injured patients included in the series (calculated according to the day of discharge from the unit) was 13.04 percent (94).

LENGTH OF STAY OF PATIENTS

The average length of stay per month of all patients admitted to The Hospital during the period of the study was 5.84 days. The highest value of 6.66 days and the lowest value 4.0 days occurred in April, 1983 and March, 1983 respectively.

TABLE 5:36

The distribution of the length of stay of head injured patients in the trauma unit

Length of stay	Number of cases	Percentage of sample (N=717)
≤24 hours	338	47.14
25 -72 hours	156	21.76
4 - 7 days	100	14.78
8 - 14 days	66	9.21
15 - 21 days	26	3.63
22 - 28 days	9	1.26
>29 days	16	2.28
TOTAL	717	100.00

The length of stay of 12 patients (1.65 percent) of the total sample was not recorded. The average length of stay per month for head injured patients in the trauma unit was 5.08 days. The length of stay may have been affected by associated injuries therefore one cannot presume that all minor concussions were discharged within 24 hours. The highest value was obtained for March, 1983 (8.82 days) and the lowest value for April, 1983 (2.69 days). This is exactly opposite to the overall figures for The Hospital. 47.14 percent (338) of the sample were hospitalised for ≤24 hours.

DISCUSSION

As discussed in the literature review epidemiological findings must be viewed with regard to the geographic, environmental and socio-economic circumstances, cultural beliefs and values of the population under study. Although this study concerns white patients only, the age and sex distribution of the patients included in this study show a similar distribution to those of Marshall, et al. (1983) and Maitra (1981). Noticeable monthly variations in the mechanism of injury did occur. No obvious reasons for the variations were apparent. The researcher would like to suggest various local factors that may be of importance to the mechanism and frequency of head injuries. These suggestions are speculation not proven facts; further research to establish a causal relationship is necessary.

2.1.1 **The Hospital is a specialist hospital that serves a large region.** Therefore the figures could be slanted and may not be representative of the total country.

2.1.2 Suggestions with regard to road traffic accidents:

a. School and university vacation - Transvaal school and university vacations occur over December, January, April, July and September.

b. Public holidays and long weekends - During both these periods the flow of traffic within the city is altered as many of the city dwellers leave Johannesburg for the vacation period (December). Perhaps the incidence of road traffic accidents alters when the inhabitants return to the city after the vacation periods and long week-ends (April). No explanation in terms of vacations, holidays or celebrations can be supplied for the increased incidence in March.

c. There is a relative increase in head injuries from road traffic accidents in November. Perhaps this is related to the festive season and end of year celebrations.

d. Consumption of alcohol - According to the records, only 8.23 percent (60) of the patients had consumed alcohol prior to the head injury. It is the belief of the researcher that the consumption of alcohol was not recorded in the 'Patients Admission Register', therefore this figure was misleading and should be treated with caution, perhaps even ignored, as it was not truly representative of the consumption of alcohol by the patients included in the sample.

e. The introduction by the Provincial Traffic Department of the pre-Christmas 'Drink and Drive' campaign may be another reason for the low incidence of head injuries in December.

f. The enforcing of the speed limit - 60 km. per hour in build-up areas and 100 km. per hour on freeways (1983/84). In April/May 1984 the speed limit on certain freeways was increased to 120 km. per hour. (Perhaps this may be cited as a cause of increased road traffic accidents in April, 1984).

g. The weather conditions.

2.1.3 Factors pertaining to falls as a cause of head injury:

a. Age - Falls occur more often in the older age group than in the young.

b. Environmental factors - Condition of pavements and road surfaces.

c. Alcohol consumption.

d. Pre-existing diseases such as epilepsy and hypotension.

2.1.4 Factors pertaining to assaults as a cause of head injury:

a. The socio-economic and cultural environment.

b. Alcohol consumption.

c. Festive season celebrations.

2.1.5 Factors pertaining to gunshots as a cause of injury:

a. The psychosocial and emotional climate.

b. Economic depression.

c. Seasonal suicidal tendencies.

2.1.6 Factors pertaining to sports injuries as a cause of head injury:

a. Favourable weather conditions for outdoor sporting events.

b. The affinity of the South African population for sport.

c. Vacation periods - Student vacation periods allow for more time to participate in sport (April) but in January and February many students are away on vacation, therefore there could be a lower incidence of sport as the cause of injury.

The severity of injury is divided into minor and more severe injuries. Insufficient information, with regard to the severity of the head injury and the patients' level of consciousness on admission, was documented in the 'Patients Admission Register'. The Glasgow Coma Scale was used infrequently to describe the patients level of consciousness. Thus the categorization of patients from the register into minor, moderate and severe injuries could not be undertaken.

84.89 percent (618) of the patients admitted to the trauma unit were as a result of a direct admission. 15.11 percent (110) of head injured cases were admitted as a result of an interhospital or intrahospital transfer. Thus it is important for emergency, accident services and transferring hospitals to be aware of the protocol of management of the head injured patient (APPENDIX T).

The length of stay of the head injured patients in the trauma unit was less than that of the average length of stay of patients admitted to the hospital. This fact is of importance when considering staffing. The greater the patient turnover the more nursing personnel required.

Registered Nurses need to be aware of the implication of a study of this nature. Nurses must utilize epidemiological findings with regards to preventive, promotive, curative and rehabilitative health services (vide p11).

2.2 EPIDEMIOLOGY OF PATIENT GROUP

A resume of the epidemiological findings. A total of 20 white head injured patients were selected from 1 November, 1983 - 30 April, 1984 for inclusion in the study.

SEX DISTRIBUTION

TABLE 5:37

Sex distribution

Sex	No. of cases
Male Female	17 3
TOTAL	20

MALE : FEMALE RATIO

17 : 3

5.67 : 1

This is higher than the ratio of 3.7:1 for the general sample (vide p212).

AGE DISTRIBUTION

TABLE 5:38

Age distribution of patients

Case number	Age (years)
1	39
2	28
3	50
4	29
5	27
6	28
7	23
8	17
9	21
10	25
11	37
12	18
13	18
14	13
15	43
16	25
17	26
18	17
19	35
20	32

Age ranged from 13-50 years.

The mean age of the total sample: 27.30 years.

The mean age of the males: 28.59 years.

The mean age of the females: 20 years.

The mean age of the general sample was higher than that of the selected cases (vide p212).

MARITAL STATUS

TABLE 5:39

Marital status

Marital status	No. of cases (N=20)
Single	13
Married	3
Common-law wife	1
Divorced	2
Widow*	1

* This patient lost her husband in the accident.

65 percent of the patients were single.

MECHANISM OF INJURY

TABLE 5:40

Mechanism of injury

Mechanism of injury	No. of cases (N=20)
Motorvehicle accident	12
Motorcycle accident	3
Pedestrian vehicle accident	3
Fall	1
Gunshot (non-suicidal)	1

18 (90 percent) patients included in the study were injured as a result of road traffic accidents. One was injured as a result of a fall and the other as a result of a non self-inflicted gunshot injury.

SEVERITY OF INJURY

According to the assessment of level of consciousness on admission, all patients included in the study suffered a severe head injury. For further discussion of patient status and severity of injury on admission vide p223/226 .

ROUTE OF ADMISSION OF PATIENTS TO TRAUMA UNIT

TABLE 5.41

Route of admission

Route of admission	No. of cases (N=20)
Direct admission to trauma unit	8
Interhospital transfer	9
Intrahospital transfer	3

LENGTH OF STAY

TABLE 5:42

Length of stay in trauma unit

Case number	Length of stay (no. of days)
1	71
2	43
3	69
4	14
5	12
6	40
7	60
8	9
9	2
10	1
11	43
12	18
13	2
14	6
15	6
16	15
17	22
18	14
19	27
20	12

The average length of stay of the selected cases was 24.65 days, whereas the average length of stay of all patients in The Hospital over the same six months was 6.0 days.

3. SELECTION OF SAMPLE

20 cases were selected according to the criteria (vide p122).

TABLE 5:43

Monthly distribution of patients

Month	No. of cases (N=20)
November, 83	6
December, 83	5
January, 84	5
February, 84	1
March, 84	0
April, 84	3

Although head injured patients were admitted throughout the study the majority of patients did not fulfil the criteria and were thus excluded from the study (vide p112).

TABLE 5:44

The distribution of the periods of observation per day of the week

Day	Distribution (N=20)
Monday	4
Tuesday	2
Wednesday	3
Thursday	3
Friday	3
Saturday	2
Sunday	3

The care of patients on all days of the week was examined.

4. PATIENT STATUS

As the assessment of the patient on the day of admission and the day of observation and the patient dependency rating concerned all 20 patients the researcher has chosen to present the data relating to the former prior to the section on the pre-injury status of the patient, family knowledge and patient recovery, as the latter only concerns those patients alive 12 months after injury.

4.1 DESCRIPTION OF PATIENTS ON DAY OF ADMISSION

The status and management of the 20 patients after the injury on admission to The Hospital is described. An initial assessment of the patient following brain trauma was required:

Author Abelson N M
Name of thesis The Comprehensive care of the Moderate and Severely Head injured Patient 1987

PUBLISHER:
University of the Witwatersrand, Johannesburg
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