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THE INSTITUTE FOR REHABILITATION
AND RESEARCH

MARKET SITUATION AUDIT

Prepared By
TMH Services Marketing
December 23, 1988

TABLE OF CONTENTS

Executive Summary.....	i
The Market, Introduction.....	1-3
Exhibit 1 Rehabilitation Beds in the U.S.....	4
Exhibit 2 Rehabilitation Centers in the U.S.....	5
Exhibit 3 Number Disabled Individuals, Nationally.....	6
Exhibit 4 Rehabilitation Beds in Texas.....	7
Exhibit 5 Rehabilitation Facilities in Texas.....	8
Exhibit 6 Selected Areas With Hospital-based Rehab Units....	9
Exhibit 7 Texas Facilities with CARF* Accreditation.....	10
Programs, Introduction.....	11
Spinal Cord Program.....	12-13
Exhibit 8 Analysis of First Admissions.....	14
Exhibit 9 Analysis of First Admissions, High Quads.....	15
Head Injury Program.....	16-17
Exhibit 10 Head Injury Rehab Services in Texas.....	18-19
Exhibit 11 Analysis of First Admissions.....	20
Amputee Program.....	21-22
Exhibit 12 Analysis of First Admissions.....	23
Stroke Program.....	24-25
Exhibit 13 Analysis of First Admissions.....	26
Sponsors.....	27-29
Referrals.....	30
Exhibit 14 Referrals in Rehabilitation.....	31
Appendix A Freestanding Facilities in Texas.....	32
Appendix B Patient Days for Texas Rehab Hospitals.....	33
Appendix C Utilization of Rehab Hospitals in Texas.....	34
Appendix D Selected Areas with Hospital-based Rehab Units....	35
Appendix E Analysis of Admissions - Other Programs.....	36
Appendix F Program Evaluation.....	37

EXECUTIVE SUMMARY

The environment of rehabilitation has changed in recent years. The future outlook is for stiffer competition, expanded requirements with fewer resources, and more stringent cost constraints. Comprehensive facilities can no longer compete on the one-dimensional plane of patient care. The number of stakeholders per patient has increased as has their influence in the rehabilitation process.

Management must define TIRR's mission and establish the goals and objectives for the facility and each program. Management is strongly encouraged to integrate the resources of information available within TIRR in this process. The results of a strategic plan will provide the needed focus for determination of the proper program and patient mix. Since strategic planning may represent a new task for some individuals, management should also be aware of the need to internally market not only the results of the planning process, but the concept itself.

Care should be taken in responding to current reports regarding the increasing need for rehabilitation beds. There is a distinction to be made between need and demand. This concept is even more vital in light of the fact that there are currently 37 million uninsured individuals in this country of whom 1 out of 10 is a Texas resident.

The changes in the environment necessitate a different view of sponsors and referral sources. Sponsors are becoming increasingly sophisticated in their ability to track costs and analyze reimbursement trends. Referral sources are gaining more influence in admission decisions and should be viewed as allies in the rehabilitation process.

Clinically, there is increasing momentum toward the unbundling of services and specialization. This will shift a greater proportion of emphasis on the outcome of rehabilitation programs. TIRR must be able to capture significant results from its programs and communicate them to stakeholders. These trends relate directly to the need for important management and marketing decisions to be made now.

TIRR must validate its mission with the groups to whom it hopes to appeal. The commitment of service must be expanded beyond the patient to include the additional stakeholders. Institutions which are able to put together a management concept in a way that delivers a product effectively, and are aware of the nuances of their markets, what their costs are, what their programs are, and how long it takes to achieve their total outcome will not only survive but succeed.

THE MARKET

Introduction

Since 1981, the number of designated rehabilitation beds in the U.S. has been increasing at an annual rate of 18-19 percent, and the number of hospitals solely devoted to rehabilitation has increased almost 27 percent since 1985 (Exhibits 1 and 2). The Fourth Annual Survey of Health Care Chief Executive Officers revealed that over 36 percent of all hospitals had converted acute care beds into either skilled nursing, rehabilitation or psychiatric care. An additional 21 percent of the CEOs reported that they were considering similar conversions in the near future. In 1986, the national rehabilitation market was estimated to be 38 million individuals with expenditures for care reported at \$4.5 billion. This figure is projected to increase to \$6 billion by 1990. Considering rehabilitation's ranking in the top five successful diversification strategies and its number two ranking in pretax profit margin (13 percent), it is obvious that the operative word for the rehabilitation provider is competition.

Reasons for Expansion

- o The single factor influencing the rapid growth in rehabilitation is DRGs.
- o The rehabilitation industry was exempted from Medicare's 1983 prospective payment legislation, thereby providing an opportunity to convert under-utilized bed capacity into revenue-producing beds.
- o The importance of this exemption is magnified by the demographic trends of the U.S. It is estimated that by 1990 the portion of the population 65 years of age or over will rise to 12.6 percent. Those 75 years of age or over are predicted to account for 5.4 percent of the population by 1990.
- o Advances in medical research and technology have also affected the growth of rehabilitation. Improvements in life-prolonging technology and improved trauma systems have increased the probability of survival.
- o Social changes have also occurred. New seat belt laws, reduction in speed limits, and organized movements against drunk driving have reduced the number of motor vehicle fatalities and resulted in higher survival rates.

- o There has also been an increase in the amount and the success of political pressure applied by disabled groups.

Who Are the Rehabilitation Patients

- o There are an estimated 18 million individuals aged 18 to 64 who are disabled (Exhibit 3).
- o The Department of Health and Human Services reports that 39 percent of our citizens over 64 years of age have an impairment that limits major activity.
- o Approximately one third of those who are receiving rehabilitative care have some form of neurological impairment.
- o Another one third have muscular-skeletal impairments such as arthritis, traumatic skeletal injuries, and/or amputation.
- o The remainder suffer from impairments associated with catastrophic diseases such as cancer, heart and lung disease and diabetes.

Bed Need vs. Bed Demand

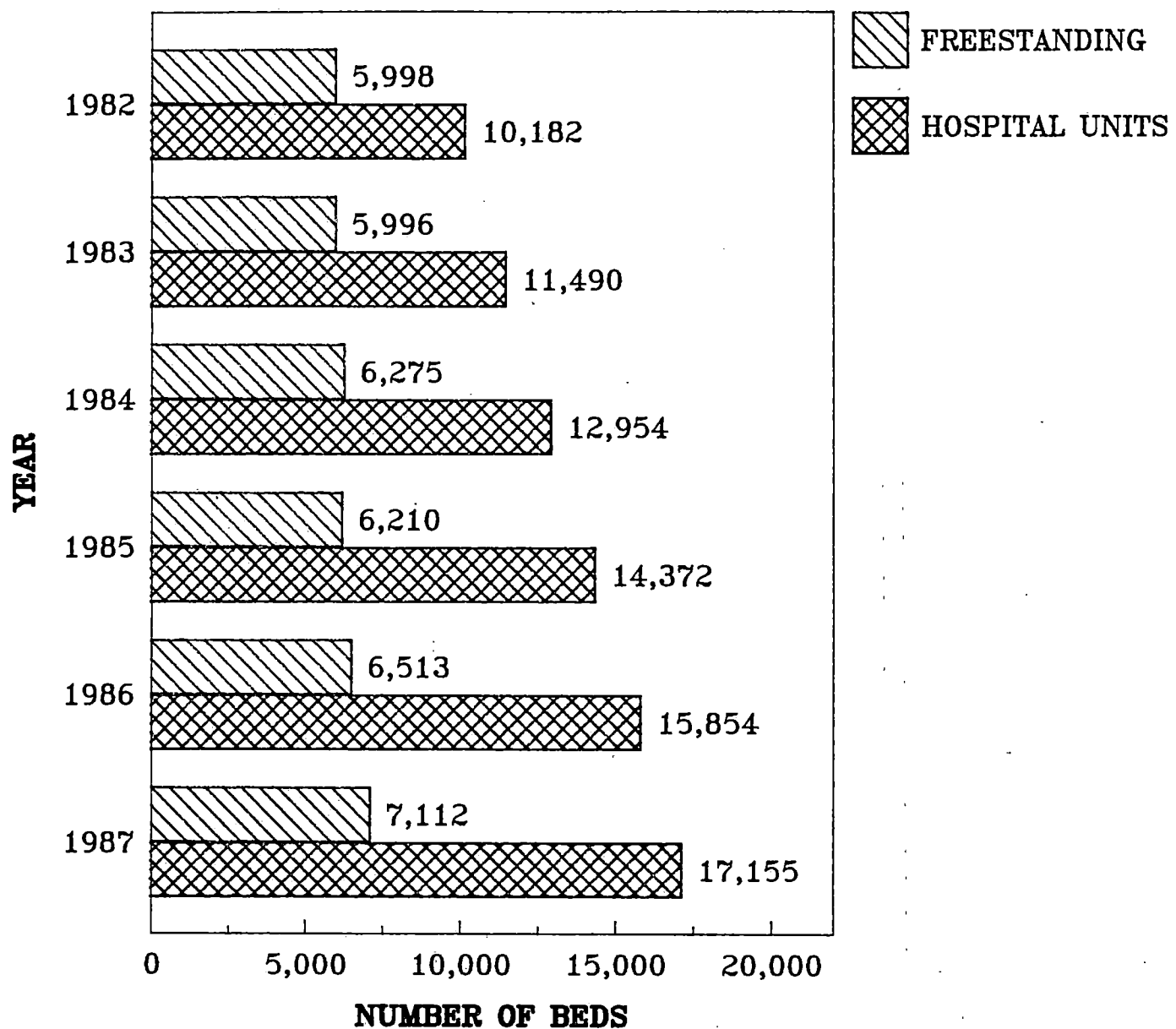
- o Bed need is defined as the number of beds required to serve patients who an objective observer would believe would benefit from rehabilitative care. Bed demand is the number of people actually seeking such care.
- o Comparatively little professional effort has been devoted to determining the need for comprehensive rehabilitation beds.
- o Few methodologies have been developed and those that exist are relatively unsophisticated. An example of the dilemma this fact may cause can be found in a recent study conducted by Washington, D.C. which estimated actual need for rehabilitation beds in the area might range from 150 to 696.
- o For acute care services, the demand for service approximates the need for service, but there is not a similar correlation between need and demand for rehabilitative services.
- o Inadequate public and physician awareness of state-of-the-art rehabilitation techniques and their benefits may account for the difference between need and demand.

- o Another factor is the lack of universally accepted standards or criteria for assessing rehabilitation services, admissions, length of stays, treatment services, and discharges, which makes many third-party payors reluctant to offer coverage for comprehensive rehabilitation services.

Rehabilitation in Texas

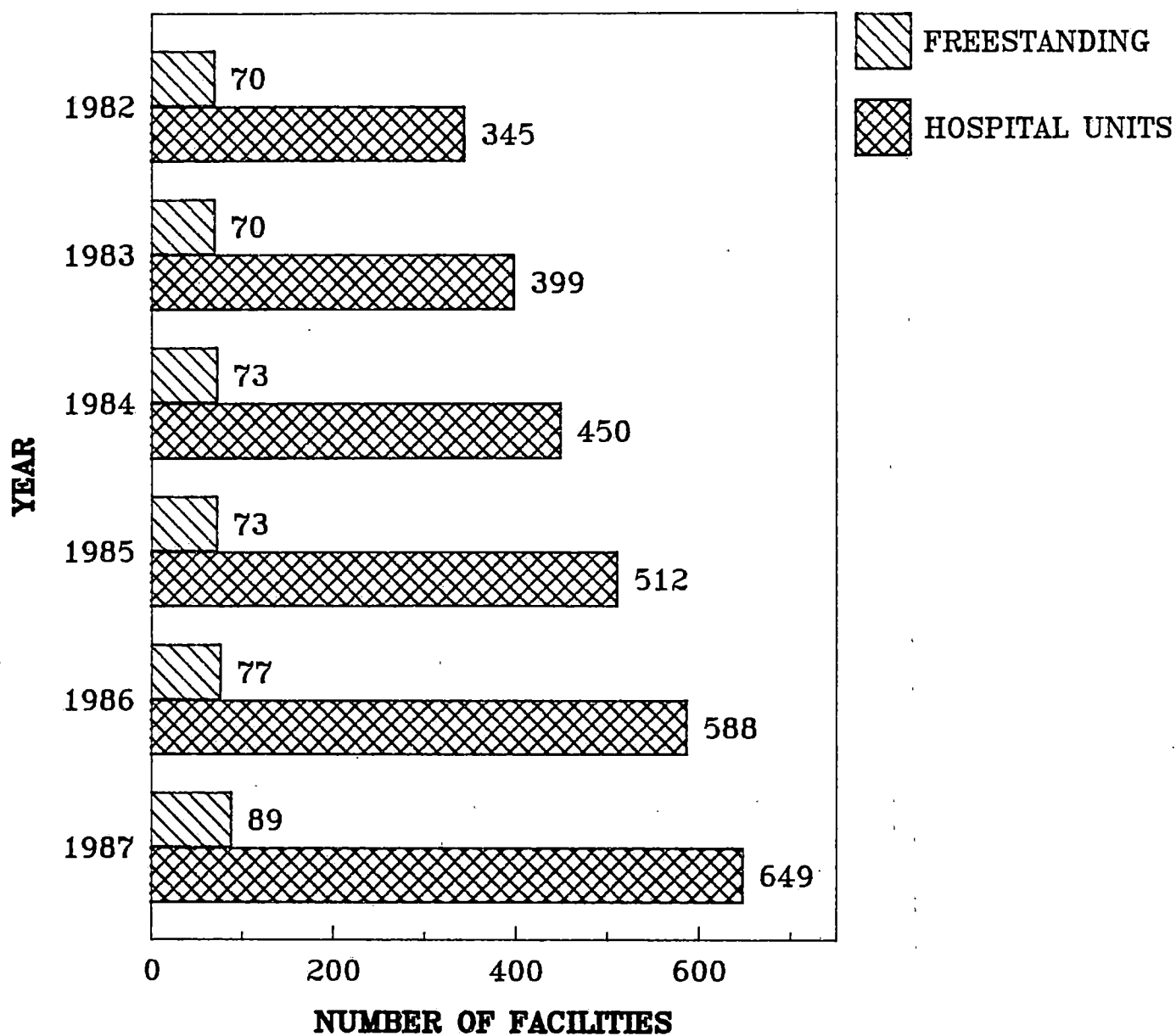
- o Since 1985, the West South Central section of the country has been one of the most competitive regions.
- o According to the 1988 American Hospital Association's Hospital Statistics, rehabilitation beds in Texas have increased almost 44 percent since 1985 (Exhibit 4).
- o Likewise, the number of hospital-based rehabilitation units has increased 48 percent since 1985, while free-standing rehabilitation hospitals have increased 75 percent for the same time period (Exhibit 5).
- o Of the 1,422 beds reportedly designated for rehabilitation in Texas for 1987, over 68 percent were in hospital units.
- o The majority of available beds, as well as actual patient days, are reported to be in the Houston area (Exhibit 6).
- o The 1987 American Hospital Association Guide reported seven (7) freestanding facilities within the state.
- o The March 1988 edition of the Commission on Accreditation of Rehabilitation Facilities (CARF) report listed 26 facilities in Texas.
- o Approximately 35 percent of these are comprehensive inpatient rehabilitation accredited facilities (Exhibit 7).

REHABILITATION BEDS IN THE U.S.A.



Source: American Hospital Association

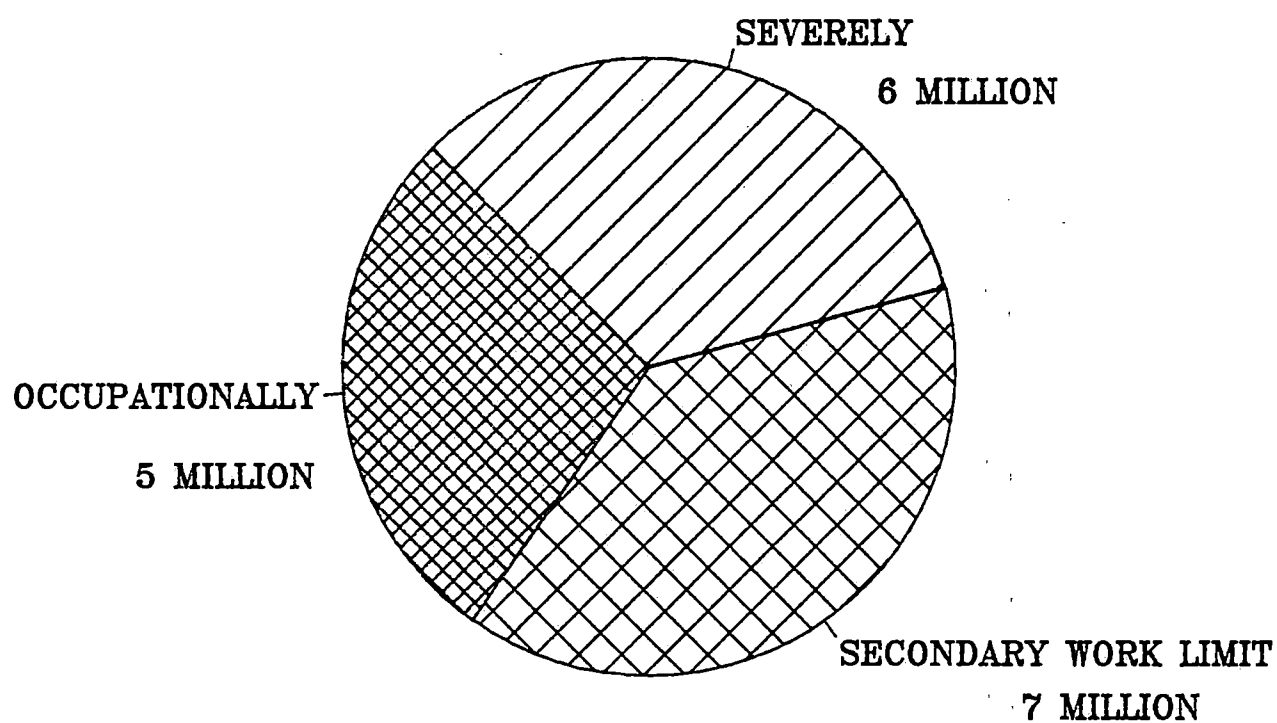
REHABILITATION FACILITIES IN THE U.S.A.



Source: American Hospital Association

NATIONAL DISABLED INDIVIDUALS

AGES 18 TO 64

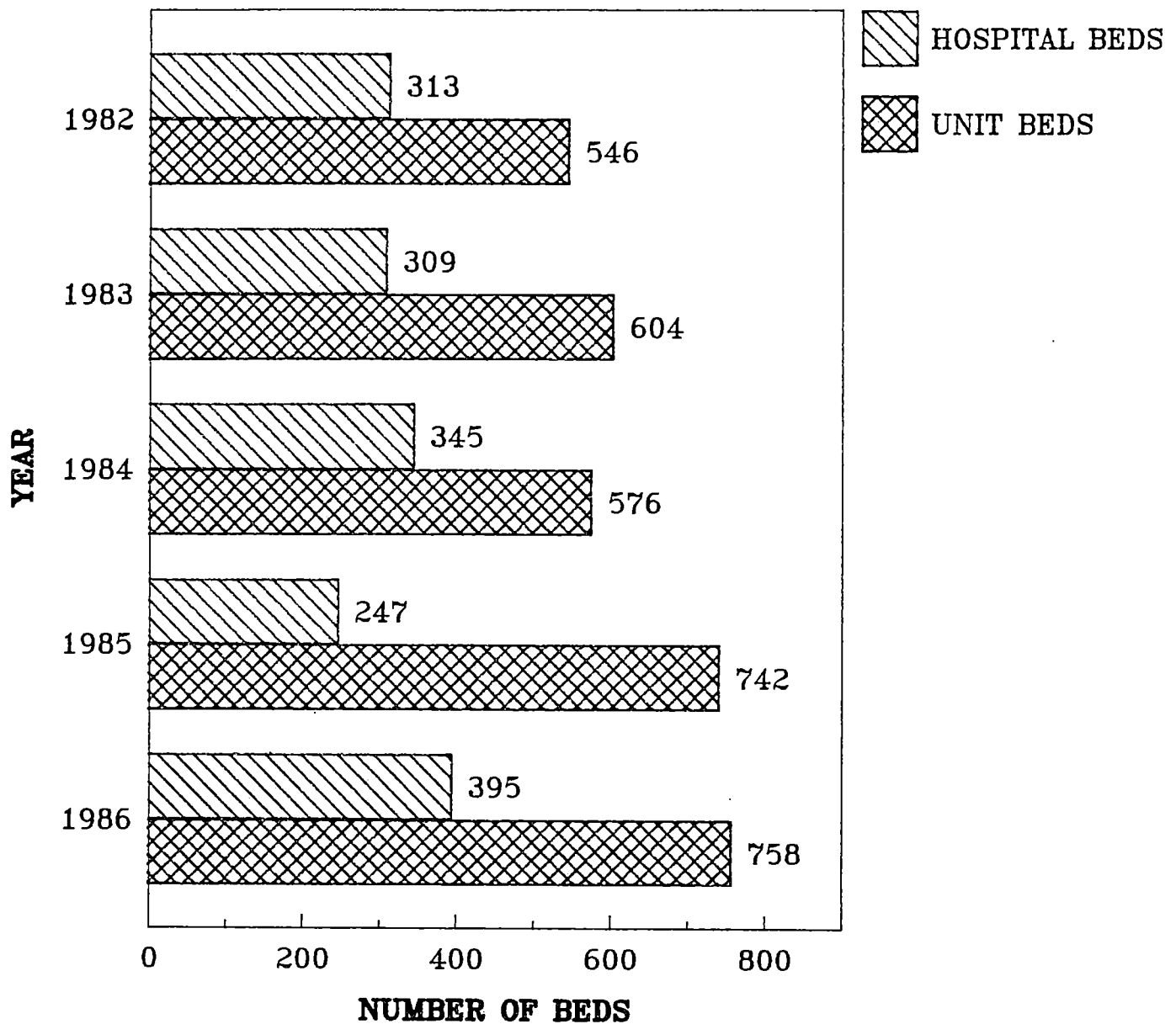


TOTAL: 18 MILLION

NUMBER OF DISABLED
BY CATEGORY

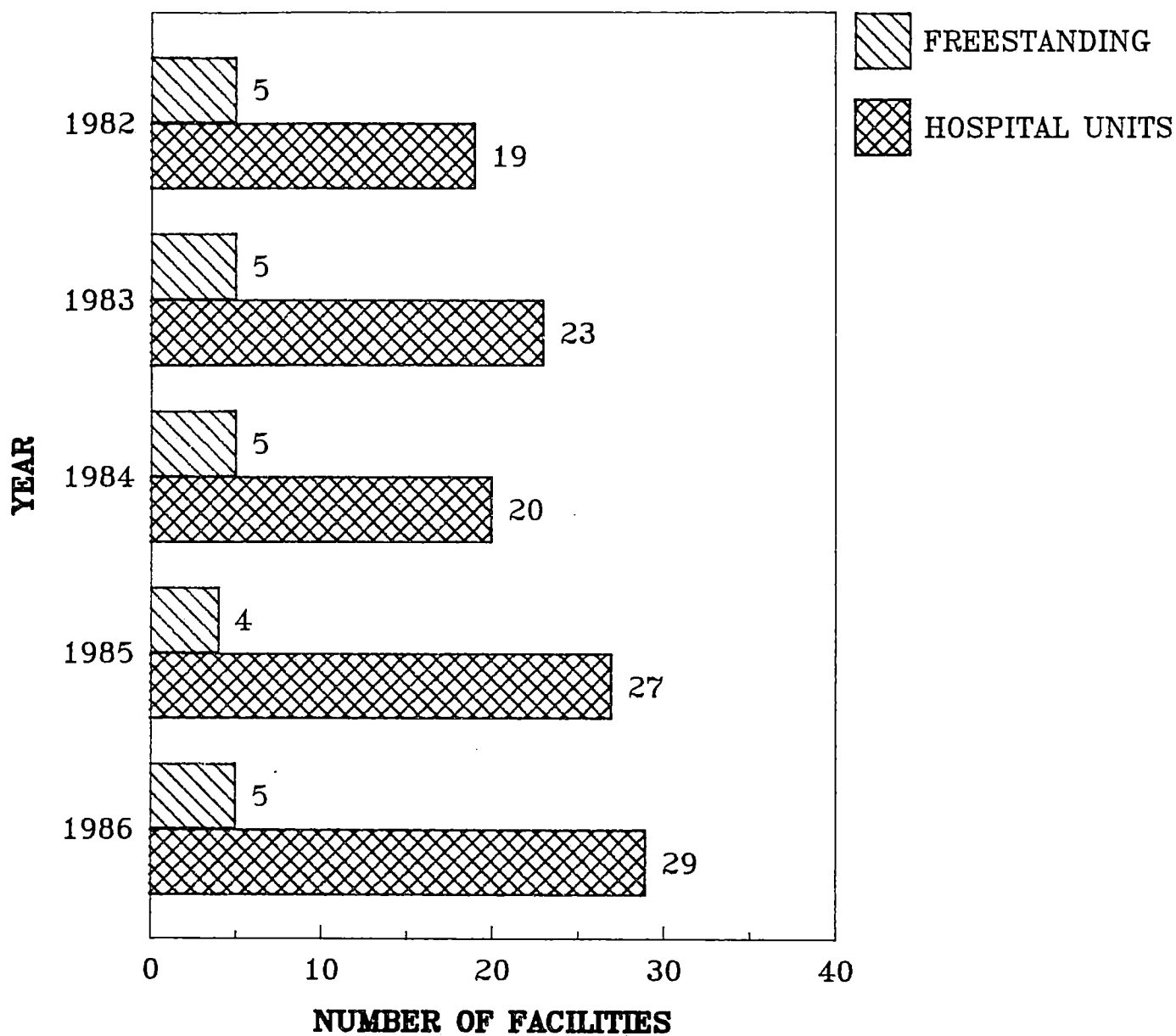
Source: American Hospital Association

REHABILITATION BEDS IN TEXAS



Source: Texas Department of Health

REHABILITATION FACILITIES IN TEXAS



Source: Texas Department of Health

Exhibit 6

HOSPITALS WITH REHABILITATION UNITS
SELECTED TEXAS CITIES - 1986

<u>Area</u>	<u>Beds</u>		<u>Patient Days</u>	
	<u>#</u>	<u>% Of Total</u>	<u>#</u>	<u>% Of Total</u>
Austin	37	4.3%	7,712	4.1%
Dallas/Ft. Worth	96	11.1%	22,877	12.2%
El Paso	20	2.3%	6,396	3.4%
Houston	209	24.1%	32,068	17.1%
Lubbock	38	4.4%	12,625	6.7%
San Antonio	<u>100</u>	<u>11.5%</u>	<u>23,388</u>	<u>12.5%</u>
Total	<u>500</u>	<u>57.7%</u>	<u>105,066</u>	<u>56.0%</u>

Source: Texas Department of Health

CARF* COMPREHENSIVE INPATIENT REHABILITATION SERVICES IN TEXAS

Baylor Institute for Rehabilitation
Vocational Services Building
Dallas, TX
Programs: CIR/H, VE, WA

Baylor Institute for Rehabilitation
Dallas, TX
Programs: CIR/H, VE, WA

Rehabilitation Services
Presbyterian Hospital of Dallas
Dallas, TX
Programs: CIR/H

Harris Methodist Fort Worth
Fort Worth, TX
Programs: CIR/H

Ambulatory Hospitals of Texas
DBA King William Health Care Center
San Antonio, TX
Programs: CIR/H, CP/I-O, VE, AS

St. Joseph Hospital
Rehabilitation Services
Forth Worth, TX
Programs: CIR/H

HCA Medical Center Del Oro Ho
Houston, TX
Programs: CIR/H, BI

Institute for Rehabilitation
Research
Houston, TX
Programs: CIR/H, SCI, BI, VE

Rosewood Medical Center
Rehabilitation Unit
Houston, TX
Programs: CIR/H

Definitions of programs are as follows:

CIR/H.....Comprehensive Inpatient
Rehabilitation/Hospital

CIR/N.....Comprehensive Inpatient
Skilled Nursing
Facilities

SCI.....Spinal Cord Injury

CP/I.....Chronic Pain
Management/Inpatient

CP/O.....Chronic Pain
Management/Outpatient

BI.....Brain Injury

SCI.....Spinal Cord Injury

AS.....Activity Services

OMR.....Outpatient Medical
Rehabilitation

IEC.....Infant and Early
Childhood Developm
Program

VE.....Vocation Evaluatio

WA.....Work Adjustment

OST.....Occupational Skill
Training

* Commission on Accreditation of Rehabilitation Facilities

Source: Commission's annual directory

PROGRAMS

Introduction

The program categories spinal cord injury, head injury, amputee and stroke offer many challenges and opportunities for the future. Internally, the opportunities exist to maximize existing strengths and correct any weaknesses that may exist. Externally, the challenge is to improve TIRR's market position and participation. The following analysis spotlights the occasions for excellence and the possible pitfalls for each program.

SPINAL CORD PROGRAM

External Opportunities

- o The pool of potential clients is growing due to medical advances in trauma care.
- o There is a growing awareness of the need for and potential benefits of comprehensive rehabilitative care.
- o Disabled organizations are enlarging their number and their level of influence in many arenas.

External Pitfalls

- o The barriers to entry for this business are substantial.
- o There is increasing pressure from sponsors for cost containment as well as documented proof of benefits.
- o There is a projected contraction of the population which has traditionally comprised the majority of this market.
- o Social pressures are causing restrictions on activities which historically have been linked to the occurrence of this type of injury.

Internal Opportunities

- o This program enjoys a long-established presence in the market place.
- o The staff connected with the program is nationally and internationally recognized.
- o The program's position in the market is generally considered to be one of leadership.
- o Research funding is currently available to help ensure the continuation of both technical and clinical advancements.

Internal Pitfalls

- o The program's viability is not necessarily attributed to TIRR itself.

- o There is a growing belief that this program is interested only in the "upper crust" of cases.
- o There is a lack of market-driven procedures for market expansion.
- o There is an absence of documented strategies concerning the maintenance and expansion of referrals.
- o The program is heavily dependent on Texas Medical Center Hospitals for its clients.

Conclusions:

The combined external and internal opportunities which exist provide TIRR with a viable chance to maintain and expand its position in the market. Although little hard data is available for use in clearly defining the actual size of the market or for identifying current levels of potential competitors, it is reasonable to assume that this particular type of service will remain fragmented in the near future.

The pitfalls, taken in aggregate, signal a need for TIRR to create a pro-active plan for the immediate and long-range future. The single most threatening element is TIRR's dependency on Hermann Hospital for referrals. It should not be assumed that the formal and informal working relationship between these two facilities will continue into the foreseeable future. This is more clearly recognizable in light of TIRR's past experience with UTMB in Galveston. This fact combined with the possibilities of contracting market size, makes the need for strategic alternatives paramount to the continued success of this program.

A brief analysis of the Spinal Cord program admissions is presented in Exhibits 8 and 9.

Recommendation

- o A thorough program evaluation should be conducted to insure that the program's mission, goals, and objectives remain compatible with those of TIRR.
- o Define and document the targeted market and communicate the results internally and externally to all stakeholders.
- o Identify and pursue other referral sources currently available.
- o Incorporate the known needs of gatekeepers into program delivery.

ANALYSIS OF FIRST ADMISSIONS
SPINAL CORD PROGRAM (EXCLUDING HIGH QUADS)

<u>Referrer</u>	<u>#</u>	<u>Avg. LOS</u>	<u>Avg. Charge</u>	<u>Avg. Payment</u>	<u>% Paid</u>	<u>Total Charges</u>	<u>Total Payment</u>
<u>1986</u>							
TMC Hospitals	48	58.6	44,774	42,424	95%	2,149,156	2,036,338
Other Hospitals	33	63.5	53,283	52,143	98%	1,758,328	1,720,711
No Hospital Refer	<u>32</u>	<u>25.4</u>	<u>19,851</u>	<u>18,940</u>	<u>95%</u>	<u>635,239</u>	<u>606,094</u>
Total	113	50.6	40,201	38,612	96%	4,542,724	4,363,143
<u>1987</u>							
TMC Hospitals	43	61.6	50,012	42,656	85%	2,150,536	1,834,206
Other Hospitals	31	66.1	55,622	46,453	84%	1,724,283	1,440,041
No Hospital Refer	<u>31</u>	<u>17.2</u>	<u>13,391</u>	<u>11,121</u>	<u>83%</u>	<u>415,108</u>	<u>344,742</u>
Total	105	49.8	40,856	34,467	84%	4,289,927	3,618,989

Source: TIRR

ANALYSIS OF FIRST ADMISSIONS
SPINAL CORD - (HIGH QUADS) PROGRAM

<u>Referrer</u>	<u>#</u>	<u>Avg. LOS</u>	<u>Avg. Charge</u>	<u>Avg. Payment</u>	<u>% Paid</u>	<u>Total Charges</u>	<u>Total Payment</u>
<u>1986</u>							
TMC Hospitals	5	102.0	114,151	108,005	95%	570,753	540,027
Other Hospitals	14	105.0	137,552	135,049	96%	1,925,730	1,890,679
No Hospital Refer	3	87.3	119,792	116,740	97%	359,375	350,220
Total	22	102.0	129,812	126,406	97%	2,855,858	2,780,926
<u>1987</u>							
TMC Hospitals	5	120.0	157,608	153,483	97%	788,042	767,417
Other Hospitals	4	100.0	140,076	126,045	90%	560,304	504,180
No Hospital Refer	3	16.0	16,010	157,60	98%	48,060	47,279
Total	12	87.3	116,367	109,906	94%	1,396,406	1,318,876

Source: TIRR

HEAD INJURY PROGRAM

External Opportunities

- o The rate of occurrence has been fairly stable and substantial over time.
- o Clinical advances in treatment procedures and abilities have expanded the spectrum or level of injury.
- o Social advocacy for improving the availability and quality of service has intensified.

External Pitfalls

- o The number of competitors in the market has expanded rapidly.
- o Sponsors are increasing constraints, as well as requirements of rehabilitation programs.
- o The future availability level of professionals is projected to decline.

Internal Opportunities

- o TIRR has had a long-term presence in this area of rehabilitation.
- o The current program is being delivered in an organized and aggressive manner.
- o The level of expertise of the staff is considered to be high.
- o The program's involvement with continued research on a national level provides a high level of visibility.

Internal Pitfalls

- o The program currently relies on a narrow source for its referral base.
- o The distinction between the objectives and goals of the program as they relate to TIRR, as well as research projects is unclear.
- o There is a lack of documented policies and procedures for referral follow-up.

Conclusion

In terms of the level of overall competition in comprehensive rehabilitation, head injury is one of the more intense. As an example, in 1980, the National Head Injury Foundation listed 100 programs that specialized in head injury rehabilitation. In its 1988 publication of facilities having this program, the Foundation listed 400 such programs. A listing of organized programs in Texas is provided in Exhibit 10. The greatest reason for this expansion may be the financial incentives available. It is estimated that over a lifetime, care can cost over \$4 million. A second incentive may also be that this particular form of injury lends itself well to the creation of various types of delivery settings and therefore expands the spectrum available.

This is a field of services that has undergone tremendous change in recent times and one where demand is generally considered to be increasing. TIRR must begin to use its advantages in this program to expand its referral base, program development and visibility in the market to insure its future success.

A brief analysis of the Head Injury Program's admissions for 1986 and 1987 is presented in Exhibit 11.

Recommendations

- o A thorough program evaluation should be conducted and the results integrated into a strategic marketing plan.
- o A consistent and responsive program concerning referrals and sponsors must be developed and consistently executed.
- o The knowledge and expertise of the many care-givers connected with this program must be channeled in a single direction.

HEAD INJURY REHABILITATION SERVICES IN TEXAS

Baylor Institute for Rehabilitation
Dallas, TX

Ages Accepted: 8 and older

Accreditations: JCAH, CARF

Program Type: AR, DT, Em

Brazos Valley Rehabilitation Center
Bryan, TX

Ages Accepted: All

Accreditations: CARF

Program Type: DT

Brown-Karhan Health Care
Austin, TX

Ages Accepted: 18 and older

Accreditations: None

Program Type: TR, LL, IL, BD

Centre for Neuro Skills
Irving, TX

Ages Accepted: 18-25

Accreditations: None

Program Type: TR, LL, DT, IL, BD, Em

d'paul Learning Center
Ravenna, TX

Ages Accepted: 14 and older

Accreditations: None

Program Type: TR, LL

Dallas Rehabilitation Institute
Dallas, TX

Ages Accepted: 2-60

Accreditations: JCAH, CARF

Program Type: AR, DT, CT

Greenery Rehabilitation Center
Dallas, TX

Ages Accepted: 3 and older

Accreditations: None

Program Type: SR, CT, BD

Health Care Rehabilitation Center At
Brown Schools Hospital
Austin, TX

Ages Accepted: 2 and older

Accreditations: JCAH

Program Type: AR, SR, TR, DT, IL, CT,
BD, ED, Em

HEALTHSOUTH Rehab. Hosp.
Humble, TX

Ages Accepted: ALL

Accreditations: CARF

Program Type: AR, SR, CT

Kate Dishman Rehab. Ctr.
Beaumont, TX

Ages Accepted: 14 and older

Accreditations: None

Program Type: AR

New Medico Rehab Ctr. of Texas
Lindale, TX

Ages Accepted: 16 and older

Accreditations: None

Program Type: TR, LL, DT, IL,
ED, Re, Em

Reach Rehabilitation Program
Four Seasons Nursing Center
Dallas, TX

Ages Accepted: 18 and older

Accreditations: None

Program Type: SR, CT

Reach Rehabilitation Program
Four Seasons Nursing Center
San Antonio, TX

Ages Accepted: 18 and older

Accreditations: None

Program Type: SR, CT

Reach Rehabilitation Program
Manor Care Nursing Center
Houston, Tx

Ages Accepted: 18 and older

Accreditations: None

Program Type: SR, CT

St. David's Community Hospital
Austin, Tx

Ages Accepted: 12 and older

Accreditations: JCAH

Program Type: AR

Head Injury Rehab Services - continued

St. Joseph Hospital, Rehabilitation Unit
Fort Worth, TX
Ages Accepted: All
Accreditations: CARF
Program Type: AR

Transitional Learning Community
at Galveston
Galveston, TX
Ages Accepted: 18 and older
Accreditations: None
Program Type: TR, LL, DT, IL, Em

University of Texas Medical Branch
Galveston, TX
Ages Accepted: 18 and older
Accreditations: None
Program Type: AR

Warm Springs Rehabilitation Hospital
Gonzales, TX
Ages Accepted: All
Accreditations: JCAH
Program Type: AR

Definitions of programs are as follows:

AR...Acute Rehabilitation	IL...Independent Living
SR...Subacute Rehabilitation	CT...Coma Treatment
TR...Transitional Living	BD...Behavior Disorders
LL...Lifelong Living	ED...Education
HC...Homecare	Re...Respite/Recreation
DT...Day Treatment	Em...Employment

Source: 1988 Edition National Directory of Head Injury Rehabilitation Services, National Head Injury Foundation

ANALYSIS OF FIRST ADMISSIONS

HEAD INJURIES PROGRAM

<u>Referrer</u>	<u>#</u>	<u>Avg.</u> <u>LOS</u>	<u>Avg.</u> <u>Charge</u>	<u>Avg.</u> <u>Payment</u>	<u>%</u> <u>Paid</u>	<u>Total</u> <u>Charges</u>	<u>Total</u> <u>Payment</u>
<u>1986</u>							
TMC Hospitals	52	66.2	46,116	42,818	93%	2,398,051	2,226,539
Other Hospitals	18	51.5	31,734	27,466	87%	571,207	494,384
No Hospital Refer	<u>9</u>	<u>34.1</u>	<u>23,440</u>	<u>22,092</u>	<u>94%</u>	<u>210,964</u>	<u>198,829</u>
Total	79	59.2	40,256	36,959	92%	3,180,221	2,919,752
<u>1987</u>							
TMC Hospitals	38	47.5	39,107	30,840	79%	1,486,068	1,171,920
Other Hospitals	26	68.7	68,625	62,306	91%	1,784,249	1,619,964
No Hospital Refer	<u>17</u>	<u>18.9</u>	<u>13,728</u>	<u>12,205</u>	<u>89%</u>	<u>233,382</u>	<u>207,489</u>
Total	81	48.3	43,256	37,029	86%	3,503,699	2,999,373

Source: TIRR

AMPUTEE PROGRAM

External Opportunities

- o The aging of the population may increase the market potential for this service.
- o Technological advances continue to expand the opportunities for increased independence for the patient, thereby making this service more attractive.
- o There is increasing recognition by significant sponsors of the benefits of a full-service comprehensive rehabilitation program.
- o There is a slow but steady local economic recovery which may influence industrial and commercial expansion.

External Pitfalls

- o Barriers to entry are slight, therefore allowing for multiple providers of care.
- o There is lack of awareness of the benefits of comprehensive rehabilitation by many consumers, referrers, and sponsors.
- o The market potential for service is influenced by economic factors.
- o There are current and potential governmental regulations concerning reimbursement.
- o There is an inability to accurately define the current market or determine the future market size.

Internal Opportunities

- o TIRR has an established reputation for being a quality, full-service provider for this type of rehabilitation.
- o The present program appears to be structured in an organized manner and is staffed with experienced individuals.
- o There are on-going research projects in place to continue the advances of care and technological devices.

Internal Pitfalls

- o The reputation of the program is intimately tied to individuals and not to the institute itself.
- o There is a lack of clearly defined and documented mission, goals, and objectives.
- o There is a lack of documented policies and procedures concerning the interaction of the programs staff and referrers and/or sponsors.

Conclusions

The increasing number of elderly individuals, as well as a growing industrial and commercial work force increases the likelihood of an expanded market. The awareness of rehabilitation benefits help insure that the increased need will be coupled with increased demand.

However, low barriers of entry combined with the financial incentives currently available increases the possibility of stiffer competition in this service area. It is, therefore, imperative that TIRR determine its niche in the spectrum of care and strategically plan for the future.

A brief analysis of the Amputee Program's admissions for 1986 and 1987 is presented in Exhibit 12.

Recommendations

- o Establish and document the program's mission, goals, and objectives in a manner consistent with those of TIRR.
- o Perform a thorough program evaluation to insure compliance with the program's mission.
- o Establish policies and procedures to document clinical outcomes.
- o Incorporate the policies established by TIRR for responding and interacting with gatekeepers.
- o Establish and implement programs to educate and inform key referrers and sponsors concerning the advances and abilities found at TIRR.

ANALYSIS OF FIRST ADMISSIONS

AMPUTEE PROGRAM

<u>Referrer</u>	<u>#</u>	<u>Avg. LOS</u>	<u>Avg. Charge</u>	<u>Avg. Payment</u>	<u>% Paid</u>	<u>Total Charges</u>	<u>Total Payment</u>
<u>1986</u>							
TMC Hospitals	8	27.4	18,049	17,125	95%	144,392	137,003
Other Hospitals	1	25.0	16,381	13,792	84%	16,381	13,792
No Hospital Refer	<u>13</u>	<u>15.5</u>	<u>6,847</u>	<u>6,571</u>	<u>96%</u>	<u>89,012</u>	<u>85,426</u>
Total	22	20.5	11,642	10,948	94%	256,135	240,864
<u>1987</u>							
TMC Hospitals	3	22.7	12,778	6,273	49%	38,333	18,818
Other Hospitals	2	20.5	11,324	10,713	95%	22,647	21,426
No Hospital Refer	<u>15</u>	<u>13.5</u>	<u>6,519</u>	<u>6,107</u>	<u>94%</u>	<u>97,779</u>	<u>91,606</u>
Total	20	15.6	7,938	6,593	83%	158,579	131,850

Source: TIRR

STROKE PROGRAM

External Opportunities

- o This program type is financially attractive in that over 90 percent of likely patients are medically insured.
- o The growing proportion of the population which typifies this service is increasing the available market size.

External Pitfalls

- o Due to the low entry barriers associated with this rehabilitation service, the market is becoming continually saturated by suppliers.
- o The impending changes in reimbursement procedures may drastically alter the way this service is delivered.

Internal Opportunities

- o The Stroke Program currently enjoys an established and geographically broad referral base.
- o Due to the nature of the other rehabilitation programs, the expertise exists at TIRR to service the more complex patient cases.

Internal Pitfalls

- o There appears to be a lack of commitment to this particular program at TIRR.
- o The actual focus of the program is unclear.
- o The program lacks a dynamic market presence.

Conclusions

The majority of hospital-based rehabilitation units are focusing on the stroke victim. Although there are a reported 400,000 occurrences of strokes each year, it is unlikely that the market will continue to demand services from the inpatient rehabilitation facility.

Analysis of the Stroke Program's admissions for 1986 and 1987 is presented in Exhibit 13.

Recommendation

- o Conduct a program evaluation.
- o Use the referral systems available within the medical community to discover niches which are presently not served.
- o If after the evaluation, it is determined to continue the support of this program, special effort should be made to associate and cooperate in a meaningful manner with various support groups.

ANALYSIS OF FIRST ADMISSIONS
STROKE PROGRAM

<u>Referrer</u>	<u>#</u>	<u>Avg. LOS</u>	<u>Avg. Charge</u>	<u>Avg. Payment</u>	<u>% Paid</u>	<u>Total Charges</u>	<u>Total Payment</u>
<u>1986</u>							
TMC Hospitals	24	40.1	24,893	22,856	92%	597,436	548,532
Other Hospitals	26	43.3	27,571	24,842	90%	716,850	645,900
No Hospital Refer	<u>8</u>	<u>39.4</u>	<u>21,894</u>	<u>19,973</u>	<u>91%</u>	<u>175,154</u>	<u>159,786</u>
Total	58	41.4	25,680	23,349	91%	1,489,440	1,354,218
<u>1987</u>							
TMC Hospitals	11	36.5	24,341	19,793	81%	267,750	217,724
Other Hospitals	22	30.9	20,750	17,801	86%	456,492	391,629
No Hospital Refer	<u>4</u>	<u>20.5</u>	<u>13,869</u>	<u>10,320</u>	<u>74%</u>	<u>554,477</u>	<u>41,279</u>
Total	37	31.5	21,073	17,585	83%	779,719	650,632

Source: TIRR

SPONSORS

Introduction

The coverage provided by the client's sponsor often influences the type, source, and duration of treatment that will be sought and received. The sponsors should be aware of the services offered, history of success, and the probable costs involved with the different programs. Communication with the sponsor can lead to increased referrals, faster and more complete reimbursements, and peace of mind for patients and their families. As a result of interviews with insurance industry representatives, the following lists of criteria and recommendations and possible reimbursement alternatives highlight the concerns, needs and visions of the sponsors.

Important Issues in Criteria of Selection Process

- o A proven record of previous successes and the required expertise to handle a particular case.
- o The philosophy of treatment should include:
 - total family involvement of family and/or significant others.
- o Facility's outpatient follow-up program.
- o Adequate staffing to service patient's needs.
- o Unbundling of services where appropriate.
- o Use of coordinator for each patient to help answer questions through the course of treatment.
- o Cost containment as a concern.
- o Billings itemized in detail.
- o Comprehensive reports provided periodically.
- o Understanding of alternatives and the decision making factors concerned with choice consultation when prosthesis, braces, wheelchairs, or other equipment is purchased.

Possible Payment Alternatives

The following are industry observations concerning possible payment alternatives rehabilitation facilities may face in the future:

- o ICD-9-CM system of disability and disease coding..
- o Retention of some form of cost-based reimbursement system.
- o Budget review by fiscal intermediary.
- o Catastrophic impairment groupings.

Response to the Alternatives

Modified DRGs could prove difficult due to the inflexibility of diagnostic categories. Also payments based on present DRGs may not adequately cover the current level of resource consumption in rehabilitation facilities. An ICD-9 system which focuses on the patient etiology is less of an artificial basis than DRG basis. Review by an intermediary could present problems when based on subjective decisions by individuals removed from the rehabilitation setting. Catastrophic impairment groupings may more accurately reflect the intensity of services required by rehabilitation patients.

Conclusion

What this means to TIRR is that each program offered must be structured in such a manner that sponsors are involved and informed throughout the patient's stay. Mutual educational exchanges between the provider and the purchaser of the service is critical. In the light of the changing environment, TIRR must accurately assess the level of demand and demonstrate that the techniques and practices of rehabilitation are efficacious.

Recommendation

- o Identify desired sponsors.
- o Seek out rehabilitation nurses and coordinators, and learn who in the insurance companies are the claims managers responsible for rehabilitation programs.
- o Suggest, coordinate and implement facility visits.
- o Suggest to sponsors that a facility representative visit the company to learn about claim management philosophy and techniques.

- o Address issues that concern sponsors' responsiveness, flexibility, cost containment, innovative care, billing, reporting and target dates for discharges.
- o Keep the sponsor informed about the course of treatment, results, and necessary changes.
- o Increase the facility's visibility by volunteering to help sponsors with claims training for employees and clients.
- o Participate in education programs and association meetings to increase the visibility of the rehabilitation programs in the community.

REFERRALS

Introduction

One of the most basic policies for any rehabilitation facility concerns the establishment and cultivation of the relationship between the facility and the referring source. TIRR does not have such a policy or an organized function to respond to this matter. A recent national survey of physicians conducted by Medical Economics found the following as suggested methods of attracting and retaining referrals.

Report back promptly	33%
Establish friendly relations with colleagues	22%
Make an effort to return patient	11%
Deliver scientific lectures	7%
Offer referring physician an active role in case	5%
Teach in a hospital	4%
Teach in a medical school	3%
Make one's availability known	2%
Entertain colleagues	1%
Publish scientific papers	1%
Other	11%

Many of these issues are important to the other sources of referrals rehabilitation is faced with today.

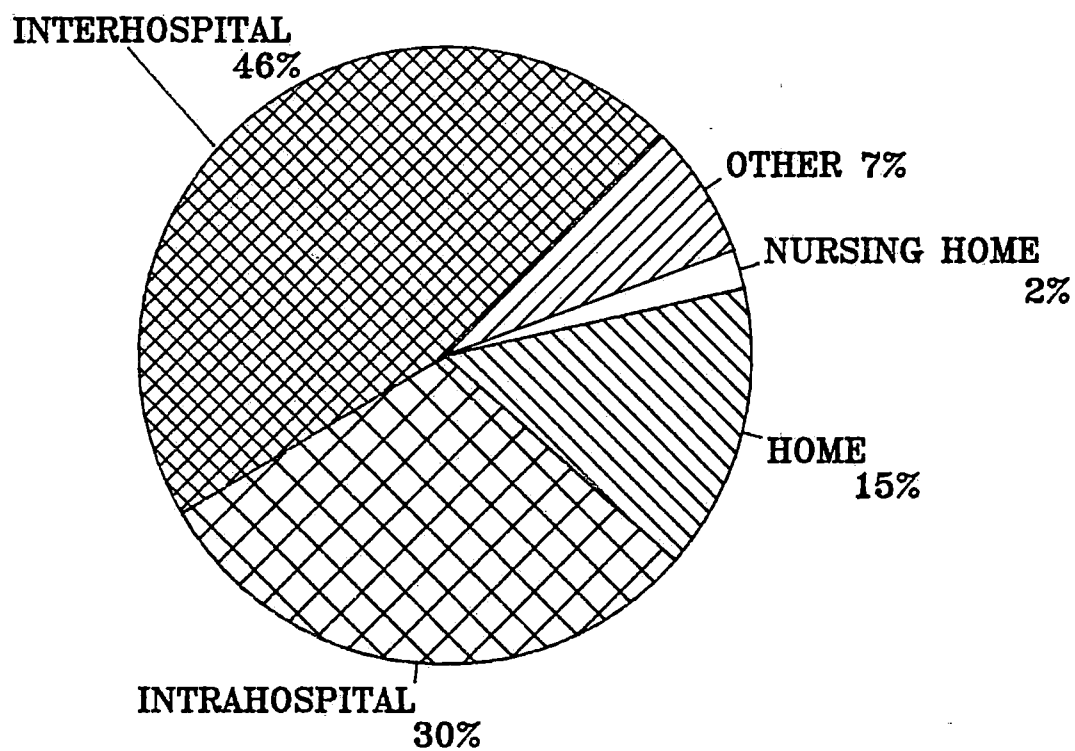
Conclusions

The location within the Texas Medical Center is an enormous advantage for TIRR. The opportunity exists for strong relationl ties to be made not only with influential physicians but also with other referral sources. The key to effectively establishing and building this type of relationship is communication. TIRR must determine its goals for the future and then target those individuals who are instrumental in achieving those goals. But unlike the past this action plan must be coordinated, and just as importantly, it must be consistent throughout all the programs within TIRR. Documented procedures must be developed and followed regarding referral relations.

Recommendations

- o Identify gatekeepers associated with the programs TIRR desires to pursue.
- o Insure open and non-cumbersome channels of communication between the significant parties.
- o Develop and implement a procedure for recognition of all referrals.
- o Develop and implement necessary procedures to insure consistent periodic updates to referral source.

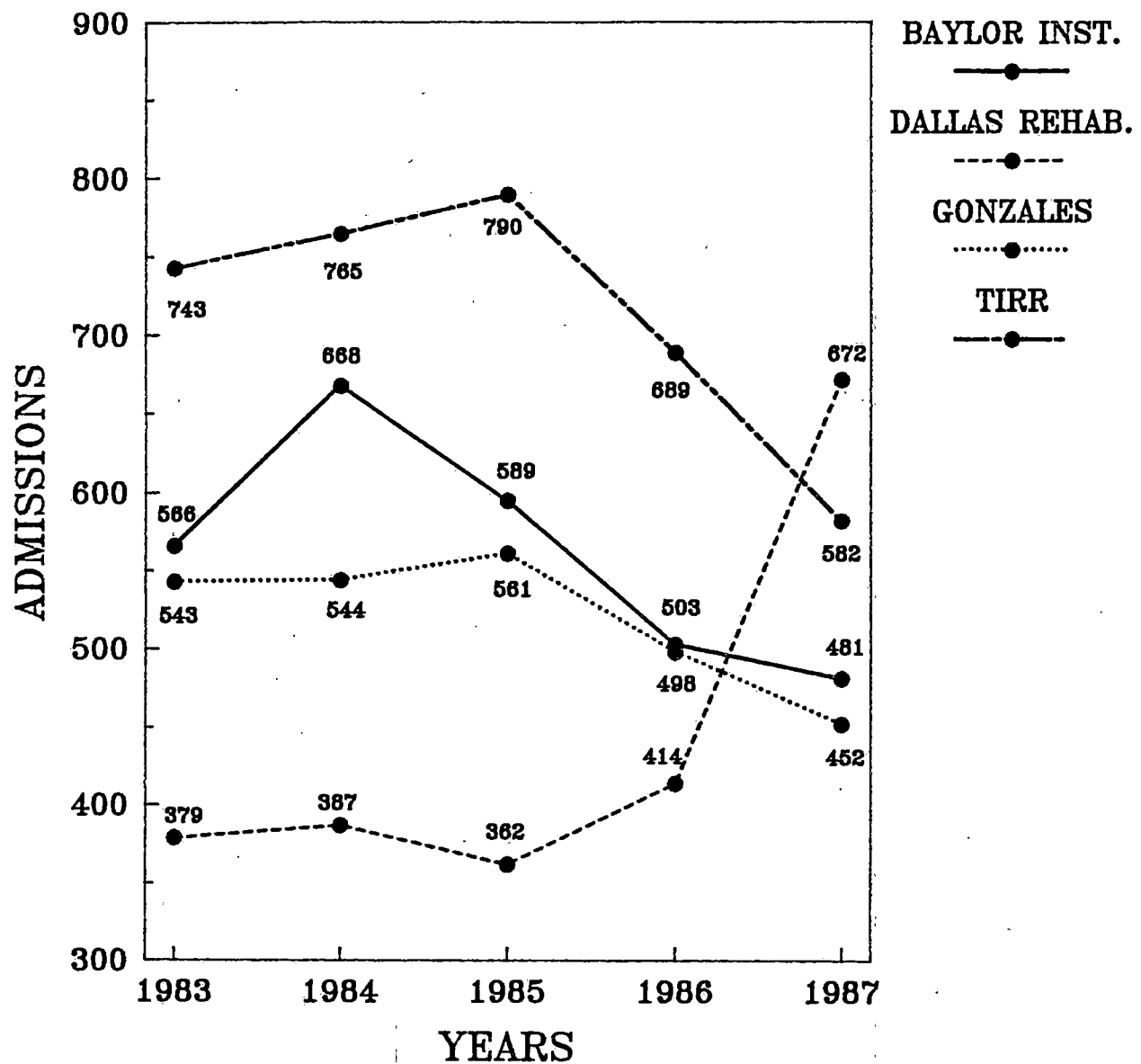
REFERRALS IN REHABILITATION



PERCENT OF REFERRALS BY SOURCE

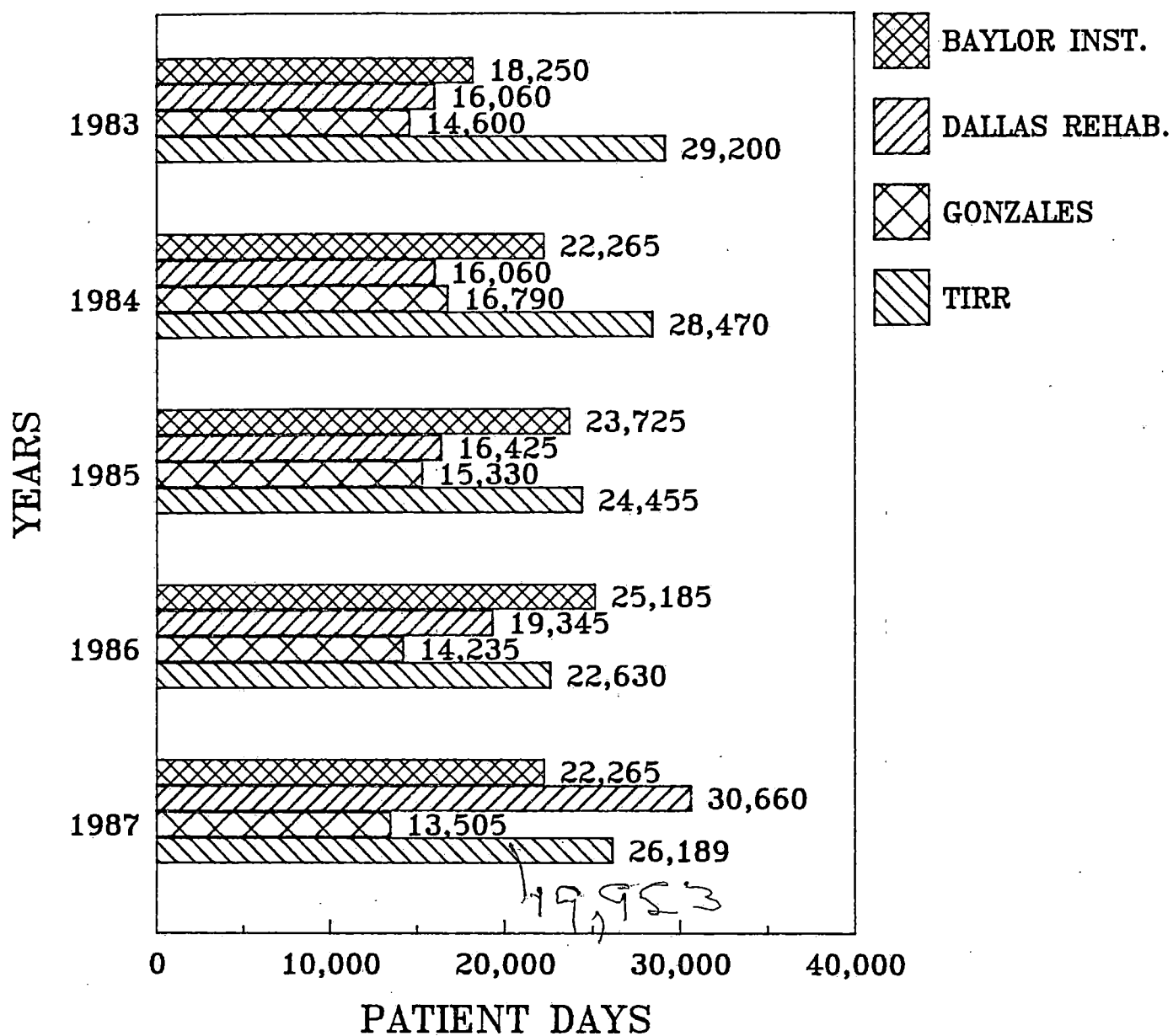
Source: Texas Department of Health

FREESTANDING FACILITIES IN TEXAS



Source: Texas Department of Health

REHABILITATION HOSPITALS IN TEXAS PATIENT DAYS



Source: Texas Department of Health

UTILIZATION OF REHABILITATION HOSPITALS IN TEXAS

	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
<u>Baylor Institute for Rehabilitation</u>					
Beds	74	74	74	74	74
Admissions	481	503	589	668	566
Census	61	69	65	61	60
Percent Occupancy	82.4%	93.2%	87.8%	82.4%	67.6%
Estimated Pt. Days	22,265	25,185	23,725	22,265	18,250
Estimated ALOS	46	50	40	33	32
<u>Dallas Rehabilitation Institute</u>					
Beds	120	120	47	47	47
Admissions	672	414	362	387	379
Census	84	53	45	44	44
Percent Occupancy	70.0%	64.6%	95.7%	93.6%	93.6%
Estimated Pt. Days	30,660	19,345	16,425	16,060	16,060
Estimated ALOS	46	47	45	42	42
<u>Gonzales Warm Springs Hospital</u>					
Beds	68	68	68	68	54
Admissions	452	498	561	544	543
Census	37	39	42	46	40
Percent Occupancy	54.5%	57.4%	61.8%	67.6%	74.1%
Estimated Pt. Days	13,505	14,235	15,330	16,790	14,600
Estimated ALOS	30	29	27	31	27
<u>TIRR</u>					
Beds	91	91	90	115	93
Admissions	582	689	790	765	743
Census	72	62	67	78	80
Percent Occupancy	79.0%	68.0%	69.8%	73.6%	86.0%
Estimated Pt. Days	25,189	22,630	24,455	28,470	29,200
Estimated ALOS	45	33	31	37	39

Source: American Hospital Association

SELECTED AREA HOSPITALS WITH REHABILITATION UNITS
1986

<u>City</u>	<u>Facility</u>	<u>Ownership</u>	<u># Beds</u>	<u>Patient Days</u>
Austin	St. David's	Other N-P	37	7,712
Bedford	Harris Methodist -HEB Northh	Other N-P	11	1,523
Dallas	Presbyterian Hospital	Other N-P	32	8,774
Fort Worth	Harris Methodist, Ft. Worth	Church	12	2,727
(Euless)	Harris Methodist - HEB South	Other N-P	11	1,523
	St. Joseph	Church	30	8,330
Houston	AMI Twelve Oaks	Corporation	10	1,557
	Del Oro	Corporation	70	9,984
	Memorial NW	Other N-P	25	7,963
	Memorial SE	Other N-P	20	2,657
	Memorial SW	Other N-P	47	9,034
	Rosewood	Corporation	37	873
Lubbock	St. Mary of the Plains	Other N-P	38	12,625
San Antonio	Saint Rose Catholic	Other N-P	50	11,694
	Santa Rosa/Villa Rosa	Other N-P	50	11,694

Note: Units which are contained in facilities that are governmental, city, state, and/or federal have been excluded.

Source: Texas Department of Health

ANALYSIS OF FIRST ADMISSIONS

OTHER PROGRAMS

<u>Referrer</u>	<u>#</u>	<u>Avg. LOS</u>	<u>Avg. Charge</u>	<u>Avg. Payment</u>	<u>% Paid</u>	<u>Total Charges</u>	<u>Total Payment</u>
<u>1986</u>							
TMC Hospitals	6	26.5	13,121	11,631	89%	78,723	69,823
Other Hospitals	1	20.0	17,344	14,797	85%	17,344	14,797
No Hospital Refer	<u>36</u>	<u>15.6</u>	<u>10,078</u>	<u>9,029</u>	<u>90%</u>	<u>362,208</u>	<u>325,029</u>
Total	43	17.2	10,672	9,527	89%	458,875	409,703
<u>1987</u>							
TMC Hospitals	7	20.4	12,839	9,588	75%	89,876	67,117
Other Hospital	3	38.0	25,612	24,568	96%	76,936	73,703
No Hospital Refer	<u>17</u>	<u>17.6</u>	<u>11,955</u>	<u>9,934</u>	<u>83%</u>	<u>203,242</u>	<u>168,883</u>
Total	27	20.6	13,702	11,470	84%	369,955	309,703

Source: TIRR

PROGRAM EVALUATION

Objectives

- o Identify the results and measure effect of program on the individual.
- o Provide a measure that demonstrates the consistent endeavor of the facility to deliver optimal care and to achieve goals with the available resources.
- o Produce evidence of a well-defined, organized program.

Essentials

- o A written statement of facility's purpose, program goals and objectives that are both achievable and measurable.
- o A provision for measurement of effectiveness.
- o A mechanism to provide documentation to appropriate parties.
- o Results should be made available to the governing body and staff.
- o A mechanism for regular and continual review of adequacy.
- o A mechanism for identification and analysis of problems, action taken, problem remonitoring and the final action taken to resolve the problem.

originals

Document Originally
Attached to
Following Page

MEMORANDUM

D R A F T
- - - - -

Date: March 22, 1991

To: Louisa Adelung
Catherine Bontke
Robert Campos
R. Edward Carter
Rebecca Clearman
William Donovan
Marcus Fuhrer

Gayla Harris
Karen Hart
Shuh-Ming Hsu
Frances Pendergraft
Saleh Shenag
Cheryl Sohrabian
Charlotte Stelly-Seitz

From: Charlie Beall

As you know, I am committed to developing a functional strategic plan for TIRR which will guide us into the 21st Century. I believe this plan should focus principally upon our programs. It should affect our operational decision-making process, and it should determine allocation of present and future resources necessary to reach our objectives.

In order for our plan to be maximally effective, it must clearly take into account our present strengths as well as our weaknesses, and it must be based on a reliable assessment of market conditions and trends. It should also encompass the broad range of TIRR activities, including research and education, and it should be soundly tied to TIRR's mission and organizational philosophy.

As the first step in an interactive strategic planning process, I would like each of you to respond to the attached survey. In so doing, I encourage you to solicit input from staff members and colleagues in your department, program, or service. Following the completion and summary of this first-cut data, I plan to meet with you, as a group, to review and discuss the product of our shared thoughts. At that point, it will be important to begin a shaping and validation process which will involve our board of trustees and other stake holders whom we may identify.

While our plan must be dynamic enough for us to adapt to changing circumstances, it must also be concrete enough for us to move deliberately forward. In order for us to have our strategic plan sufficiently well developed to guide our budget planning process this year, we need to move quickly ahead. Therefore, I would like your responses to this survey to be transmitted to me, along with any supplementary information which you would like to present at this time, by April 15, 1991.

For reference, you will find attached certain pertinent materials. If you have additional reference material which you feel may be useful in our planning efforts, please forward it to

Memorandum
March 22, 1991
Page 2 --

Lex Frieden for further review and distribution. Also, if you have any questions or suggestions concerning this stage of plan development, feel free to contact Lex or me. Thank you for your cooperation and participation in this important activity.

cc: Lex Frieden

STRATEGIC PLAN
Survey I

Please respond on separate paper to the following questions. Be as concise and as specific as possible. Short phrases and outlines are welcome. This will not be the last opportunity for elaboration or input. Forward completed responses to Charlie Beall by April 15, 1991. If you have any questions about this exercise, contact Lex Frieden at ext. 5283. Thank you.

1. What primary program or service components, and what research and education programs should TIRR maintain and/or develop over the next three years? (List and provide brief rationale.)
2. What reallocation of existing resources (i.e., personnel, facilities, administrative support, etc.) or what new resources will be necessary to facilitate implementation of programs/services listed above.
3. If appropriate, explain how the above suggestions relate to:
 - a) TIRR's overall research, education, and clinical service mission,
 - b) patient/client needs,
 - c) TIRR strengths,
 - d) TIRR weaknesses,
 - e) competitive forces,
 - f) sponsorship options,
 - g) health care and disability policy trends,
 - h) health care financing and industry trends, and
 - i) trends and expected developments in the field of rehabilitation.
4. If action is taken to carry out the suggestions made above, in what ways, if any, would TIRR be different in three years than it is today?

3/22/91

THE INSTITUTE FOR REHABILITATION AND RESEARCH

MISSION

As its fundamental purpose, TIRR will act to return the physically impaired person to an autonomous, active, and productive, community-based lifestyle outside of an institution, through the provision of specialized services, including hospital care.

TIRR will provide specialized tertiary medical and comprehensive rehabilitation programs for complex rehabilitation problems as well as general rehabilitation programs, and will be a knowledge resource for other professionals, community hospitals and rehabilitation services for the region. TIRR will serve the acute intercurrent needs of the severely physically disabled patient.

TIRR will continue to be one of the world leaders in medical rehabilitation programs, rehabilitation research, and education.

Specifically, TIRR will improve the rehabilitation process through research and education. We will originate, demonstrate, apply, evaluate, and disseminate new medical and surgical diagnostic and therapeutic techniques, perspectives, technologies, management techniques, and care delivery system structures and networks that improve the effectiveness and efficiency of the rehabilitation process.

Source: TIRR Long Range Plan, 1985

Census Projections
Planning for 1991

PROGRAM DESCRIPTIONS

SCI: Quad I - Rehab I Quad
Quad Other - Rehab II-IV Quad
Para I - Rehab I Para
Para Other - Rehab II-IV Para
SCI All - Rehab I-IV Quad & Para

TBI: Rehab I - TBI

AMPUTEE: Amputee I - Rehab I Amputee
Amputee Other - Rehab I-IV Amputee
Amputee All - Rehab I-IV Amputee

STROKE: Rehab I - Stroke

PEDI: Rehab I - Pedi
Age 15 & Under, All Diagnoses

SURGERY: Plastics - All Plastic Surgery
All Plastic Medicine
Surgery Other - Urol Surgery
Neuro Surgery
General Surgery
Ortho Surgery

OTHER: Rehab V - All Rehab V
(Not including surgery)
Urol Med
Ortho Med
Neuro Med
Acute Med
Resp
Pain

1990
Discharge Analysis

Program Specific

	<u>1988</u>	<u>1989</u> (+ % 1988-89)	<u>1990</u> (+ % 1989-90)
<u>SCI</u>			
Quad I	57	35 (-38.6)*	53 (+51.4%)**
Quad Other	50	64 (+28)	42 (-34.3%)
Para I	35	29 (-17.1)*	31 (+6.8%)**
Para Other	56	40 (-28.5)	31 (-22.5%)
	=====	=====	=====
SCI TOTAL	198	168 (-15.1)	157 (-6.5%)
TBI I	64	78 (+21.8)	72 (-7.6%)
TBI Other	9	3 (-66.6)	10 (+233%)
	=====	=====	=====
TBI TOTAL	73	81 (+10.9)	82 (+1.2%)
Amputee I	10	14 (+40.0)	13 (-7.1%)
Amputee Other	13	7 (-46.1)	5 (-28.5%)
	=====	=====	=====
AMPUTEE TOTAL	23	21 (-8.6%)	18 (-14.2%)
Stroke I	44	39 (-11.3)	37 (-5.1%)
Stroke Other	0	0	2 (+200%)
	=====	=====	=====
STROKE TOTAL	44	39	39
Pedi I	41	40 (-2.4)	44 (+10%)
Surgery	41	41 (0)	36 (-12.1%)
Plastic	39	76 (+94.8)	126 (+65.7%)
Other IV	81	65 (+19.7)	34 (-47.6%)
Other	24	18	17
Missing Program	4	4	0
	=====	=====	=====
TOTAL:	568	553 (-2.6)	553 (0)

* Combined Total = (-30.4%)

** Combined Total = (+31.2%)

1990
Discharge Analysis

Rehab I - Program Specific

	1988	1989	1990	
Quadriplegic	57	35	53	+51.4%
Paraplegic	<u>35</u>	<u>29</u>	<u>31</u>	<u>+ 6.8%</u>
SCI I	92	64	84	+31.2%
Brain Injury	64	78	72	- 7.6%
Amputee	10	14	13	- 7.1%
Pediatric	41	40	44	+10.0%
Stroke	44	39	37	- 5.1%
	=====	=====	=====	=====
	251	235	250	+ 6.3%

PATIENT PROFILES
1990 Discharges
REHAB I ONLY

SEX:

Male - 67.7 %
Female - 32.3 %

RACE:

White - 70.7 %
Black - 15.9 %
Hispanic - 9.9 %
Asian - .9 %
Other - 2.6 %

TELEPHONE AREA CODES:

713 - 58.6 %
409 - 21.1 %
512 - 4.3%

STATES PATIENTS ORIGINATED:

Texas	-	88.4 %
Louisiana	-	3.4 %
Maryland	-	.9 %
Oklahoma	-	.9 %
Tennessee	-	.4 %
New Jersey	-	.4 %
Connecticut	-	.4 %
Mexico	-	.4 %
Missouri	-	.4 %
Ohio	-	.4 %
Kentucky	-	.4 %
Illinois	-	.4 %
Not Named	-	.3 %

Estimated Incidence of Spinal Cord and Traumatic Brain Injury
in the Houston/Galveston Area

Spinal cord injury: 180/year

Traumatic brain injury, moderate to
severe--requiring hospitalization: 1,044/year

Source: Estimates based on data obtained from TIRR regional SCI and TBI Centers and on current regional population base estimates of 3.6 million.

Rehabilitation Units and Free Standing Facilities
in the Houston Area
(partial listing)

HOUSTON

Free Standing Facilities

Houston Rehab Institute
Del Oro Rehab
Health South Rehab
Memorial City Rehab
Plaza Rehab Hospital @ Kingwood
Neurobehavioral Institute of Houston
Cypress Creek Neurobehavioral Institute

Rehab Units within Hospitals

St. Luke's
Hermann
Methodist
Ben Taub
Memorial Systems:
 Southwest
 Southeast
 Northwest
 Northeast

Twelve Oaks
Heights
St. Joseph's
Bayshore
Rosewood
St. John's
Sharpstown
Doctor's Hospital Conroe

Facilities Under Construction

Rehab Hospital of SW Texas - Clear Lake
Devereaux - Texas City

Outreach

Transitional Learning Community (Galveston Living Community)
Project Re-Entry (Major competitor of Challenge Program)

Rehabilitation Units and Free Standing Facilities
in Texas
(partial listing)

AUSTIN

Healthcare Rehab Center
St. David's Rehab Center
The Rehab Hospital of Austin
Brown/Karhan Hospital

BEAUMONT

St. Elizabeth's Hospital
S.E. Texas Rehab Hospital

BRYAN/COLLEGE STATION

Rehab Center - Humana Hospital - College Station

CORPUS CHRISTI

Rehab Hospital of S. Texas

DALLAS

Baylor Inst. for Rehab
Centre for Neuro Skills (Irving)
Community Re-entry Center of Texas
Dallas Rehab Institute
Greenery Rehab Center
Meadowbrook of Arlington
Pate Rehab
Presbyterian Hospital of Dallas
Spring Creek Rehab Hospital
The Rehab Hospital of N. Texas
Timberlawn Hospital Neuropsychiatry Service
Re Entry

EL PASO

Providence Memorial Hospital Rehab Center
Rehab Institute of El Paso

FT WORTH

St. Joseph Hospital
The Mabee Rehab Center - Harris Methodist - Ft. Worth
Ft. Worth Rehab Hospital
Health South Rehab Hospital

GONZALES

Warm Springs Rehab Hospital

HUNTSVILLE

Huntsville Memorial Hospital Rehab Center

LINDALE (TYLER)

New Medico Rehab Center of Texas

SAN ANTONIO

Rebound Inc.
Rehab Center of S. Texas
Rehab Institute of San Antonio (RIOSAS)
Saint Rose Hospital & Rehab Center
Warm Springs, San Antonio
Spring Hill Rehab Network

SAN MARCOS

Tangram Rehab Network

TEMPLE

Scott & White

VICTORIA

Devereaux Foundation

1990 YEAR END STATISTICAL ANALYSIS

I. The 1990 year-end stats were pulled by MIS and loaded into Lotus (computer in Directors Office) to produce the graphs. It is very important that these stats are based upon DISCHARGES and not admissions. At this time there is no way to pull data from the main frame based upon admissions. The reports concerning Referral Sources is pulled from the RID system that is operating in the Marketing Department.

II. A second set of year-end stats have been generated by the RID system. These stats are for February through December only as the new RID's were not up and running until February, 1990. These reports represent referrals received by the Marketing Department/Liaisons only. Every call received should be entered into the computer system with a date, referral source and disposition. Lynn Bratton produces the reports. These reports will be generated in 1991 on a monthly basis.

:yes

COMPETITOR ANALYSIS
1990 Semi-annual Inpatient Charges .

The following chart gives a cost comparison of TIRR's charges as compared to several major competitors.

INJURY	TIRR		*DEL ORO	*CRAIG	DALLAS *REHAB	HOUSTON REHAB 1989 figures	BAYLOR/DALLAS	HEALTHSOUTH
	Old	New**						
<u>Paraplegia</u>								
Un-Complicated	900	980^	800	750-825	900-1100	850	800-850	950
Complicated	950		800-1000			800-900	1000-1012	
<u>Quadriplegia</u>								
No-Vent	1100	1100		785		600-1000	1100	1000
Vent Dependent	1500	1500		1085	1200-2000		1600	1500
<u>TBI</u>								
Un-Complicated	875	1000^	300/Room	810	1100-1500	850-1000	950-1000	950-1000
Complicated	1400		880/NeuroEval	810-1000		850-1000	1450	1500
<u>Stroke</u>								
Un-Complicated	800	1050^	"Lots of	Accept No	900	800	900	950
Complicated	850		Medicare"	Stroke Pts Unless Young		850		
<u>Pediatric</u>								
Paraplegic	1000		No Pedi Under Age 12	No Pedi Under Age 12	No designated Beds, Parents Stay @ no cost	No designated Beds, Parents Stay @ no cost	No designated Beds, Parents Stay @ no cost	No designated Beds, Parents Stay @ no cost
Quad-VTD	1700							
Quad-No Vent	1100							
TBI	1600							
Birth Defects	760							
Amputee	800							
<u>Amputee</u>	760		NA	NA	Room Rate + Therapies		925	950

Note - All costs exclude Physician fees.

* Completed 7/90

** Completed 1/91

^ For Para, TBI, & Stroke, quotes are only for one charge, not complicated and uncomplicated.

MEMORANDUM



BAYLOR
COLLEGE OF
MEDICINE

TO: Mr. Charlie Beall

FROM: Saleh M. Shenaq, M.D.

DATE: April 15, 1991

REF: Strategic Planning Recommendations

SURGERY

1. Add the term "restorative" to the existing term "surgery" at TIRR and adopt a new name "Restorative Surgery" instead of Surgery.

Reasons:

- A. The term "restorative" is a precise and descriptive one for the services performed at TIRR for the patients in the different programs of rehabilitation.
 - B. It describes restoration of function.
 - C. It is of a marketing appeal.
 - D. It distinguishes TIRR surgical services from other common surgical services which are rendered in other hospitals in the medical center.
2. Restorative surgery services to be organized into one Department called "Restorative Surgery Department at TIRR".

The following specialized surgical services are components of this department.

1. Anesthesia Service
2. Plastic surgery and hand surgery services
3. Orthopedic Service
4. Neurosurgery Service
5. Urology and Urodynamics Service
6. General Surgery - Thoracic Service
7. Ophthalmology Service
8. ENT Service
9. Dentistry and Oral Surgery Service

10. OB/GYN Service

Advantages:

A. Organizational

1. Each service will be directed by its active member at TIRR. Needs, responsibilities and function to be coordinated with Chief of "Restorative Surgery Department". Recently a similar model was developed at Stanford and is called Functional Restoration Department.

B. Resource Requirements

1. Office space

- a. Office spaces to be allocated for the newly reorganized "Restorative Surgery Department to include:
 1. Office for Chief of department
 2. Office for head nurse of the OR in the same area.
 3. Allocated spaces for individual active members of the department, especially anesthesiology, urology, neurosurgery and orthopedics.

- C. A full time Surgical Liaison Nurse to coordinate services on the floor, consultations pool, marketing, liaison between marketing and surgery, and liaison between rehab programs and surgery. Also function of the liaison nurse is clinic coordinator, surgery schedule coordinator, etc.

- D. Full time secretary for surgery department chief.

- E. Equipment - Standard office equipment for chief of department of restorative surgery and other directors of surgical services and head nurse of the operating room, coordinator and secretary.

- F. Supplies - Standard office supplies for the above offices.

Responsibilities:

A. Department Chief

1. Functions under Vice President for Medical Affairs (Dr.

Donovan).

2. Oversee progress of each individual surgical service through direct coordination with individual directors for each service.
3. Oversee function of the operating room through OR supervisor.
4. Active participation in management council activities at TIRR.
5. Reporting to Vice President for Medical Affairs activities of surgery department's needs, strategies and plans.
6. Engagement in educational activities at TIRR on the level of individual programs and continuing education to nurses, residents and medical students. Also the participation in seminars as issued by continuing education.
7. Adopting a marketing strategy and integration of such marketing strategies along with the different marketing strategies of the existing and planned rehab programs. The responsibilities of each director will be to oversee the functions and needs of each service with the chief of the department of restorative surgery.

3. Relevance of organization of surgical services under restorative surgery department to TIRR:

A. Establishment of such department of surgery will be unique and special to TIRR since few rehab institutions in the country have a similar department. Services offered by the different specialties in the various surgical services represent an invaluable portion of the total rehab services offered to patients at TIRR.

1. Type of services:

- a. Plastic surgery - surgery of chronic wounds in the spinal cord injury patients and diabetics and amputation stumps reconstruction, burn reconstruction, facial deformities and others.
- b. Hand and upper extremity functional restoration especially in quadriplegics, burns, congenital and deformities and contractures in the head injured patient.
- c. Coordination of the hand surgery with the hand clinic for deformities, burns, paralysis and trauma and congenital.
- d. Coordination of surgery of contractures of the hand and upper extremity and feet.
- e. General surgery, abdominal gastro intestinal and chest surgery and others.
- f. Urology and Urodynamics - see Dr. Rudy's report

g. Neurosurgery, Orthopedics: Spinal surgery
Baclofen pumps
Others

4. Health Care Trends - Development of such comprehensive and integrated services of surgery and rehabilitation in a total package is offered by the team of physicians in one institution (TIRR) is very appealing to health care (insurance industry and patients). This adds to the uniqueness and the quality of patient care at TIRR and avoids fragmentation of patient care.
5. Expected outcome from change and implementation of restorative surgery at the institutional level:
 - A. Organization of the care of the surgical care along with rehabilitation.
 - B. Recruitment of new patients to be admitted for surgical purposes and the rehabilitation.
 - C. Coordination of activities in relation to marketing of each surgical service and the services as a whole along with the different rehab programs as one package to the health industry.
 - D. Individual and collaborative research with other research activities in the rehab program as it relates to the prevention and management of the pressure sore in spinal cord injury, spasticity and contracture related research, wound healing research and neuroregeneration and neurosciences.
 - E. Educational activities - state and national level through coordination of local and national seminars sponsored by TIRR through the department of restorative surgery and the different rehab programs.
 - F. Establishment of relationships through the different program directors with hospitals abroad, state-wide as well as national.
 - G. Marketing strategies in a similar fashion through exchange programs with rehab centers in different countries internationally and from the experiences of the neighboring hospitals as Methodist and St. Lukes in such an endeavor.
 - H. Establishment of new clinic called "Wound Care Clinic" along with a hyperbaric oxygen unit.
 - I. Establishment of "Burn Deformity Clinic".
6. The Operating Room:
 - A. Space - enlargement of the operating room to 4 operating rooms with at least two recovery room beds, and two waiting area beds.
 - B. Establishment of a waiting room for patient's family

- C. Doctors Lounge.
- D. Plan for a new operating room facility in the third phase of the building at TIRR.
- E. Establish a post-recovery intermediate care unit in the vicinity.
- F. Update surgical equipment as per service needs.

NAME	SUBMITTED IN RESPONSE
Louisa Adelung	no
Catherine Bontke	yes
Robert Campos	no
R. Edward Carter	no (been out of town)
Rebecca Clearman	no (will, but has been out of town)
William Donovan	yes
Marcus Fuhrer	yes
Gayla Harris	yes
Karen Hart	yes
Larry Horn	yes
Frances Pendergraft	yes
Delbert Rudy	yes
Saleh Shenaq	no
Cheryl Sohrabian	yes
Charlotte Stelly-Seitz	yes

FUTURE PLANNING

Rehabilitation Engineering:

First floor space and workshop (first floor or immediately in basement below) to demonstrate Hi tech equipment along with orthotics and occupational therapy, especially equipment developed at TIRR or sold through TIRR.

Develop more sophisticated portable patient monitoring equipment.

Pharmacy:

Develop mail service for drugs, routine and in advance, similar to PMSI.

Connect computer for pharmacy profile and screening on each outpatient.

Plan for pick-up window for refills (no parking).

Outpatient Services:

Should consider a plan to move out of, but near to, TMC along with outpatient therapies and physician's offices (for profit). In addition, may also have a small lab, x-ray unit, and pharmacy.

Must reorganize completely.

Computerize outpatient spinal cord injury care, follow-up, and pharmacy screen for each visit.

While here, should consider moving medical records to be sub-adjacent (decrease labor costs) to the clinic.

Consider geographically distant outpatient follow-up clinics over two-way T.V. by phone wires and with computerized updated care plans including medications.

Central Materials:

Develop mail order business (routine or upon order).

Plan for pick-up window (no parking problem).

Use TIRR family representatives to critique patient equipment ("TIRR Tested" as in Consumers Digest) and publicize.

Education:

Plan for closed circuit T.V. at bedside or at least to each separate nursing unit linked to the Central Communication Center. Should be

able to request "Orientation to TIRR" or other educational T.V. films for patient and/or families.

The Central Communication Center should also contain a (1) weather alarm station, (2) civil defense emergency radio facility, (3) short wave (ham radio) facility, and (4) TMC closed circuit stations with the ability to tape and replay programs at a later time. Could be run by handicapped person and could also include switchboard.

Develop educational tapes to play for distant hospitals over phone, etc.

Personnel:

Establish (with social service input) work stations within TIRR for visible employment of the severely handicapped (even part-time).

Very graphic marketing.

Management Services:

Increase responsiveness, number of personnel and long-term goals.

Should link pre-admit information, admit information, initial medical and nursing orders, ongoing care plan, pharmacy profile, discharge document, and outpatient care plans.

Re-establish the blue book in spinal cord injury for marketing.

Establish data for ventilatory dependent registry and implement.

Marketing:

Balance priorities between TBI, SCI, and other programs.

Exhibit at every TMA meeting.

May consider forming a neurotrauma consortium, i.e., trauma at birth, peripheral nerve disease or trauma, brain trauma, polytrauma, spinal cord injury, and brachial plexus trauma. In short, disability secondary to trauma and/or disease of any human nervous structure.

Spinal Cord Injury Program:

Geographically separated SCI beds with assigned teams for teaching, etc.

Organize a functional medical chart with a reorganized laboratory and x-ray reporting section.

Re-establish organized preventive statistical program (good marketing) via "Nature of Accident" questionnaire-aimed at Texas.

Develop a "pool" or monetary source to support otherwise unfundable
hi tech areas of clinical research, i.e., phrenic stimulators,
Baclofen pumps, etc.

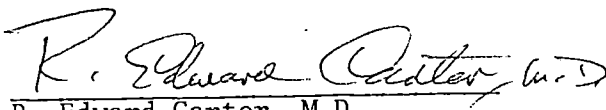
Specify a central office with Assistant Administrator to follow
through on special projects, i.e., prevention, computer planning,
review and update of all SCI policies, development of future research
proposals, etc.

Organize family representatives (TIRR reps) in all major and some
minor Texas cities to:

1. Orientate new patients and families to their community.
2. Perform local marketing and political awareness.
3. Agree to test various pieces of patient equipment (TIRR
Tested) for publication to ex-patients and insurance
companies.

Centralize patient monitoring on each nursing unit similar to ICU
programs, at night, especially for high risk patients.

Submitted by


R. Edward Carter, M.D.

L. Frieden - To
include w/ Srvt.
Plan pkg - attach
to Dr. Donovan's
pkg. -

SUGGESTIONS FOR OB/GYN

1. Relevance of Program to TIRR clinical mission:

Spinal Cord Injured patients need for a OB/GYN Clinic.

2. How TIRR strengths will support Program?

Provide extra rooms and continue with excellent nursing assistance.

3. How Program will relate to competition?

This is the only Institution addressing OB/GYN needs of the patient with SCI injury in this part of the State.

(Dr. Hunter Hamill's suggestions to Dr. Donovan)

MEMORANDUM

DATE: 15 April 1991

TO: Charles Beall, President

FROM: Catherine F. Bontke, M.D. ^(B)
Lawrence J. Horn, M.D. ^{LH/}
Brain Injury Program

RE: Long Range Planning

In response to your memo dated March 27, 1991, the Brain Injury Program at The Institute for Rehabilitation and Research (TIRR) would like to offer the following suggestions in terms of long range planning for TIRR. These are brief thoughts of what can be done over the next three years and takes into account several assumptions.

1) The incidence of brain injuries of all etiologies is increasing. Over the past several decades, more patients have been able to survive traumatic brain injury than ever before as a result of improved emergency and neurosurgical care. We estimate that there are 7,000 new moderate to severe traumatic brain injuries (TBI) and 3 to 5 times that number (i.e., 21,000 to 35,000) of mild traumatic brain injuries each year in Texas alone. In addition, there has been a slight, though important increase in the number of young people with stroke secondary to drug addiction, oral contraceptives combined with smoking and atherosclerotic vessel disease. In addition, in southeast Texas there has been an increase in the number of brain tumors, in which patients survive with physical and cognitive deficits. For example, it is estimated that each year 500,000 people suffer strokes, approximately 20% of these are under the age of 65, which would be 100,000 people. If we further extrapolate that Texas is 1/10th of the population, we could easily assume that 10,000 "young strokes" are in the state of Texas with 1,500 of them being within our catchment area. This is something we could market through the Brain Injury Program effectively, bringing younger people with acquired brain injury from a variety of etiologies into our continuum of care.

2) Comprehensive outpatient and home health services will need to be developed. Clearly, the national trend is for more outpatient and home health services and less inpatient services, given the cost and national shortage of nursing personnel. It would be appropriate to begin development of a Comprehensive Outpatient Rehabilitation Facility (CORF) or a Day Hospital for patients of all diagnoses as well as home health services. Combined with that, a transportation system in order to bring patients into the facility and a case management system that extends across the continuum of care needs to be developed.

3) There needs to be the development of evaluation and cross consultations among programs. Multiply disabled patients need the services from spinal cord injury, amputee, pediatric, musculoskeletal and the brain injury teams. We definitely have the expertise for patients with single diagnosis and we now are at the point where collaboration between the teams needs to be formalized and strengthened. As national experts in rehabilitation, we can

capitalize on our expertise and offer a comprehensive evaluation program to catastrophically injured patients.

4) We need to develop Spanish speaking teams. 10.5% of the Houston area population is only Spanish speaking and another 30% are bilingual with Spanish speaking being the primary language. These patients often get splintered, incomplete services and we are now in the position to have bilingual physicians in every program. We need to capitalize on this strength and serve our community.

5) Consultation services for disabled patients need to be strengthened and developed. Our 30 years of experience at TIRR tells us that patients with disability are less able to have access to routine health care (i.e., gynecology, psychiatry, eye, ENT, dental care, surgery and orthopedics). We can strengthen these support services and become a "full service" hospital/clinic for our disabled patients.

 6) We need to be ready to act quickly for additional research funding via a research support services plan.

Please consider some corrections to the information provided.

1) The TIRR Mission Statement and Values needs to either delete "physical" or add the words "and cognitive" on line 2 in the first paragraph.

2) The 1990 Discharge Analysis states that it is based on "Program specific" statistics. "Stroke" patients that were really on the Brain Injury Service on included in the Stroke Program's statistics. The Brain Injury Program's statistics do not accurately reflect the number of patients with all types of brain injury referred to that specific program.

3) As stated on page 1 of this memo, the estimated incidence of traumatic brain injury patients only includes traumatic brain injury and does not take into account the approximately 1,500 patients who are "young strokes" (i.e., less than 65 years of age, anoxia, metabolic and infectious encephalopathies and brain tumor survivors).

1991 Brain Injury Program

The Brain Injury Program currently has a number of services in which it provides care to primarily young people who have sustained brain injuries from a variety of etiologies, including traumatic brain injury, anoxia, metabolic and infectious encephalopathy and cerebral vascular accidents. Our average age is 33 years and the average length of stay is 63 days. In addition, the Inpatient Program which has three components: acute inpatient, for patients who are capable of responding to commands; coma management program and the evaluation program. The Challenge Program (TCP), a comprehensive day treatment facility provides educational, vocational and independent living tracks to patients with severe brain injury. The average length of stay at that facility is 3 to 6 months. That facility is now at capacity with 27 day treatment patients. An exciting development at TCP is the development of a memory lab, a technological lab containing prosthetic memory devices. In addition, there is an outpatient follow up clinic, which provided services to patients who have been inpatients, new outpatient clinic for patients who are new to TIRR and would benefit from either inpatient or outpatient services and mild traumatic brain injury clinic for those patients who have had a mild brain injury with residual cognitive or physical problems and seek guidance regarding those problems. It is anticipated that with an additional physician, we can substantially increase the services provided in each component of the program.

The Brain Injury Program is the site for two major federally funded grants totalling over \$5.2 million. In 1987, we were awarded \$1.5 million over a 5 year period for a Model Systems Traumatic Brain Injury Project from NIDRR, which we are now in year four. In 1990, \$3.7 million was awarded over 3 years through RSA, Department of Education for the Southwest Regional Brain Injury Rehabilitation and Prevention Center. This will be primarily a research and demonstration grant with a heavy emphasis on training surrounding states to provide appropriate vocational and educational services as well as prevention programs. This grant should be pivotal in providing a very strong community visibility for the Brain Injury Program in the Houston/Galveston area as well as the state of Texas and surrounding region. By the end of this school year, our prevention program will have been provided to over 14,000 school children in Harris County.

The Brain Injury Program also trains future rehabilitation physicians. Currently, one PM&R resident every two months and will soon be adding a second PM&R resident. Medical students are trained every two weeks for core rotation as well as electives. The Brain Injury Program has also been the site for fellowship training for one fellow, Dr. Patel in 1988-89 and will be the site of a second fellow in 1991-92, Dr. Stuart Yablon. We currently have the potential to bring in a second fellow for the 91-92 year, but will probably use that funding to provide additional training to residents until the second fellowship slot can be filled. We have also been the site for training for one psychiatric resident from the University of Texas and will have second during May-June, 1991.

Sub-acute services will be added shortly, with the majority of the patients being brain injured in the slow-to-recover category. Dr. Bontke has actively participated in sub-acute services at outlying facilities since 1986. The in-house facility will be programmatically managed by Dr. Lawrence J. Horn and patients from all services will be admitted to this facility from TIRR and outside facilities.

Apartments will be added within the next 18 months for disabled patients, primarily brain injured via the HUD/VOA project. We are the technical advisors on this project and as such will help fill and maintain this project. We also received the funding for an in-house practice apartment for patients and families getting ready for discharge.

Consulting services which are currently being utilized by the Brain Injury Program includes: Drs. Solis & Walker, pulmonary, primarily for tracheostomy and ventilator patients; Dr. Arlinghaus, psychiatry, primarily for medication management for agitated patients and for agitated families; Dr. Eldred, optometry, for low vision evaluations; Dr. Bowes Hamill, ophthalmology, for eye problems; Dr. Johnson, ENT, for tracheostomy, dysphagic and dysphasic patients; Dr. Pickard, surgery, for central lines and gastrostomy tube placement; Dr. Loubser, anesthesiology, for motor point blocks and nerve blocks; Dr. Roy Smith, orthopedic surgery and Dr. Sal Shenag, plastic surgery, for contracture release. Our EEG service is up and running with Dr. James Willmore, neurology providing interpretations. We hope to expand neurophysiology services over the next 18 months with Dr. Willmore's guidance.

Obviously there is a need to continue and strengthen all these activities as they have been the basis for our success as a nationally and internationally recognized Brain Injury Program.

TRANSPORTATION SYSTEM

A major limiting factor for the development of further services with The Challenge Program with utilization of the "community as a classroom" and the development of a Comprehensive Outpatient Rehabilitation Facility (CORF) is our transportation system. Additionally, therapeutic recreation and occupational therapy out trips are hampered by the lack of reliable transportation, so our inpatients suffer as well.

The Houston area does not have adequate transportation services (i.e., Metro Lift, Regular Metro Bus System) to provide an efficient method of transporting patients to and from TIRR. In addition, therapeutic recreation is a necessary part of comprehensive rehabilitation and the current transportation system is inadequate to meet our needs over the next several years. We need to look towards developing services so that patients can be brought in for their therapies, perhaps through our Volunteer Department, similar to what the American Cancer Society and American Red Cross does for patients to other facilities in the Texas Medical Center. The requirements obviously involve equipment (i.e. wheelchair accessible vans and buses) and personnel to drive.

An improved transportation program will allow us to expand outpatient services which obviously relates to the trends in expected development in the field of rehabilitation and fits the health care financing and industry trends. This cost of approved transportation system for outpatient services can be built into a per diem charge or as stated earlier be developed in conjunction with another volunteer, community-based system.

EVALUATION PROGRAM

TIRR, as an internationally recognized facility has the expertise of many departments and programs. The development of a comprehensive Evaluation Program for third party payors and attorneys would be invaluable in terms of developing our reputation as an expert and increasing revenue. The evaluation program will be designed with core teams in each disability category and patients could be admitted or seen daily through the CORF as outpatients for one to two weeks depending on need. The Evaluation Program would then not only evaluate the patient, but make specific recommendations as to the patients current needs and recommendations for improvement and modifications to the home program or recommendations to TIRR or other facilities.

Funding would be through third party payors or attorneys and could be a set fee to include a comprehensive report, on the order of \$10,000.00 weekly. Currently, rehabilitation counselors provide so-called "Life Care Plans" (sometimes without evaluating patients in the flesh) for this amount.

The development of such a service/product line would benefit the industry as a whole and would channel appropriate patients into our continuum of care.

OUTPATIENT TREATMENT

The Challenge Program (TCP) successfully addresses outpatient treatment for a sub-population of brain injury patients, but does not adequately address the needs for many patients (spinal cord, amputee, musculoskeletal, pediatrics, other brain injured patients that are not candidates for TCP). Thus, the development in terms of Comprehensive Outpatient Rehabilitation Facility (CORF) (i.e. day hospital) is necessary and reasonable. A CORF would substantially reduce cost, but allow us to continue to provide comprehensive rehabilitation services to patients who could live at home or our "Ronald McDonald type" apartment, yet come in for a full day of therapy. These would be for patients who need comprehensive rehabilitation, but not require hands-on nursing care. Certainly the industry is looking towards shorter length of stays and one way to address patient care and provide the highest quality of patient care is to look towards the development of a CORF.

The problem in the past has been that the inpatient patients get first priority and we need to balance the priorities. Third party payors including medicare and medicaid would easily pay for such services, especially if cost savings were explained.

DEVELOPMENT OF A "RONALD McDONALD TYPE" RESIDENCE FOR VISITING FAMILIES AND PATIENTS

In order to develop a nationally-based referral network, to enhance the Evaluation Program and provide housing for patients that are in the CORF or The Challenge Program, low cost residential housing for patients and families needs to be provided. This would strengthen our referral base and would allow us to more effectively manage outpatient services for patients who live too far to commute. This connected with the transportation system would then allow us to be extremely competitive. In addition, this program, which would provide just housing, could be combined with a residential treatment facility for brain injured patients.

Third party payors (esp. worker's compensation and private insurance companies) would cost-share especially if cost-savings could be explained. Although there are multiple issues in providing such facilities, this is an excellent "community project" that corporations (what about Burger King, Wendy's) or other organizations (Pilot Club, Junior League) could sponsor.

SPANISH LANGUAGE TEAMS

It would appear that with the arrival of Dr. Horn, we will have the capability, from a medical leadership standpoint, of having bilingual physicians in each of the services; pediatrics, spinal cord injury, amputee, musculoskeletal and brain injury. It would be worthwhile to investigate the feasibility of developing bilingual teams from that standpoint. At the current time, Spanish speaking only patients get less than adequate services and it would certainly be to our advantage to develop and heavily market this program. 10.5% of the Houston population speaks Spanish alone and 30% is bilingual with Spanish as their primary language. In real number terms 360,000 people speak Spanish alone in Houston and another 1,000,000 are bilingual with Spanish as their primary language. The implications of marketing to these people in our community is staggering. In addition, Houston is the hub for trading with Mexico and Central and South America and has successfully provided comprehensive medical services for people from this area. We should capitalize on these strengths.

SPECIALLY EQUIPPED EXAMINATION ROOMS FOR EYE EVALUATIONS, OTOLARYNGOLOGY AND DENTAL CONSULTANTS

Over the past 30 years it has become obvious that disabled people have less than adequate access to routine health care. This has been demonstrated by the Spinal Cord Injury RRTC as well as the Spinal Cord Injury Model Systems Project and is being seen in the Brain Injury Program as well. It is necessary to cultivate consultants to come to a special environment with patients who have mixed sponsorship. We have been fortunate in establishing a strong liaison with the Cullen Eye Center and Dr. Bowes Hamill, the ophthalmologist who provides services there and will occasionally see patients at TIRR. In the past 18 months we have established a bi-weekly low vision rounds with the School of Optometry and the Light House for the Blind, under the direction of Dr. Kia Eldred. These rounds have been immeasurable in developing strategies for visual rehabilitation and the results have been nothing short of miraculous. In addition, we have strengthened our ties with the University of Texas Dental Branch and have been getting excellent services from their residency training program with Drs. Lifestie and Coe providing services. Otolaryngology services continue to be needed because of the amount of dysphagia and dysphasia and tracheostomies that our patients present with. All of these health care professionals would benefit greatly from having a specially equipped examination room that would be accessible. This would eliminate the need to have patients transported off-site for specialty exams, would also give a full range of services to patients who are physically and cognitively disabled and need special handling by trained personnel at TIRR. Given that space will be available in the new building, this room could be easily equipped with donations from specialty sororities in the Houston/Galveston, such as special project for Kappa Kappa Gamma or one of the other service sororities. In addition, this would eliminate transportation to other facilities for examinations of these patients and would also allow us to cut down on away-from-therapy time, thus improving patient care and revenue.

CASE MANAGEMENT ACROSS THE CONTINUUM OF CARE

Case management was truly the "buzz" word of the 80's and is becoming more important in the 90's for rehabilitation services. The case manager is a pivotal person in providing information from patient and family to third party payors and interpretation of medical and therapeutic information from therapists, physicians and nurses to patient and family. Case management services allow for early discharge planning (i.e., from the day of admission) and better utilization of services and conservation of the rehabilitation dollar. Unfortunately our case management services do not extend beyond our own walls and need to start looking at community-based services and providing "at-home" and "in the community" and "at the job" case management services.

Although the industry looks towards conservation of dollars, dollars are often times put into such services, having it as a built-in fee, a comprehensive package of rehabilitation services i.e. quadriplegic patients would not only in-hospital services, but out of hospital services to better meet their needs, prevent further problems and thus save dollars. This could actually be developed as a research and demonstration project either funded by NIDRR or perhaps even by the newly created NIH Rehabilitation Medicine Division. We need to not only to provide these services, but be creative in the ways in which we can demonstrate the feasibility and cost effectiveness of such services.

CROSS CONSULTATION SERVICES

Multiply disabled patients need the services from spinal cord injury, amputee, pediatric, musculoskeletal and/or brain injury teams. We definitely have the expertise for patients with single diagnosis and we are now at the point where collaboration between teams need to be formalized and strengthened. Not only do physicians need to be consulted for a doubly-injured patient (i.e., both brain and spinal cord injury, amputee and spinal cord injury), the teams need to be involved on a team to team level. This will strengthen our position within the market place because we attract some of the most catastrophically injured patients, but first consultation across programs needs to be formalized and strengthened.

MEDICAL PSYCHIATRIC UNIT

Catastrophic injury is often accompanied by behavioral and emotional problems, which can be treated by specialized psychiatric care. Some of this care can be provided on a liaison consulting basis, similar to what is being provided by Dr. Arlinghaus in the Psychiatry Service currently. This however, will probably not be enough in the competitive market place of Houston/Galveston, we know that The Neurobehavioral Institute (formally Laurelwood) in the Woodlands will be vying for the same patients in their continuum of care. They are now in the process of hiring a psychiatrist and have been employing the services of a neurologist and are looking towards developing a Brain Injury Rehabilitation System of care not only for behaviorally impaired patients, but for physically and cognitively impaired patients. Furthermore, we see patients with a variety of sponsorships and if we continuously send our fully-funded patients to specialty psychiatric units, we will never develop the expertise within our own continuum of care. We need to look towards the development of this type of program, so that we can stay on "the cutting edge", but also be able to keep patients within our continuum of care and provide for patients who may not be as well funded for these types of services. In addition, spinal cord injured patients, amputee patients, burn patients, even patients with musculoskeletal problems suffer from a variety of psychiatric problems that can be treated in a medical psychiatric unit. This would be the natural extension of services for the consulting liaison psychiatrist, but would also give us the expertise to better manage psychiatric problems early before they become full-blown problems.

CREATIVE ARTS PROGRAM/ENHANCED THERAPEUTIC RECREATION

Patients with catastrophic injuries can benefit from the expressive arts (i.e., music therapy, dance movement therapy and art therapy). All of these have been proven in the psychiatric hospital literature and are fully billable. The Expressive Arts improve self-esteem, show patients expressive ways to manage their feelings and provide creative wholesome alternatives to boredom.

As our Animal Assisted Therapy Program (AATP) has shown, they also are extremely important in marketing our facility and create a natural "media" draw. We need to keep in mind that patients with severe injuries are less likely to be employed and the development leisure skills is a necessary for comprehensive rehabilitation.

RESEARCH SUPPORT SERVICES

The Research Program at TIRR is one of our major strengths. Unfortunately, support services to obtain additional funding and continue funding when the schedule is tight and we are short of personnel and equipment is lacking. A coordinated research support service plan needs to be developed and implemented when opportunity knocks. Unfortunately, we are not in a position to know exactly when RFPs will be issued. For example the Brain Injury Program is currently sitting in a position to be extremely competitive for the next RRTC in brain injury, however we do not know when the next call will be put out. If such a call would come out, we currently lack a method in which to gather the forces and obtain the necessary support services within TIRR to draft such a proposal.

Additionally, The National Institute of Health (NIH) has recently funded a new center for rehabilitation and research within the Institute for Child Health and Human Development. Its purpose will include fostering research and rehabilitation directly as well as a coordinating function through the NIH on research that relates to rehabilitation. This new center is in addition to the current major source of rehabilitation research grant funding, The National Institute of Disability Rehabilitation and Research (NIDRR), which is part of the Department of Education. This is a very important development within the rehabilitation research world and will truly make rehabilitation research an extremely "fundable" entity. It is important that we be ready with a comprehensive research support service plan, so when calls are issued we will be ready and have the necessary secretarial, technical and financial supports to develop competitive research funding proposals.

RESIDENTIAL PROGRAM

As the continuum of care grows it is necessary to look at which pieces of the continuum are still lacking. Certainly, there are no residential treatment programs for brain injured survivors in Houston, the closest one is in Galveston at The Transitional Learning Community (TLC). Although The Neurobehavioral Institute (formally Laurelwood) has recently put in Residential Program, it is in it's infancy, it is still under the psychiatric umbrella. It would be in our best interest in filling the gaps in our continuum to look towards the development of a Residential Program, maybe even in conjunction with the residential apartment for families and patients who visit TIRR (i.e. the "Ronald McDonald type" residence) or in conjunction with or near the Challenge Program so that patients could live off-site in some supervised housing, but yet get the educational, vocational and independent living skills necessary to re-enter the community. The Texas Rehabilitation Commission (TRC) in conjunction with Moody Foundation support has been willing to provide residential treatment for brain injured survivors at Transitional Learning Community (TLC) in Galveston, Texas. Third party payors do provide residential treatment funding at other facilities throughout the United States and it is being recognized as an important part of brain injury rehabilitation.

RESPITE CARE PROGRAM

One of the trends within the elderly population is the development of "Elder-Care" and Alzheimer Day Treatment facilities. These are low cost respite type programs or day care for Alzheimer patients and frail elderly. These patients do not require nursing home placement but, because their caretakers work during the day, they need day care. Respite Care Program have been utilized in the mental health/mental retardation field for a number of years and it is certainly worthwhile to look at the feasibility of such programs for brain injured survivors and severely physically impaired patients who require hands-on care throughout the day. We know, for example that when you take one person in the family out of the work force, many times you need to have another person of the family also out of the work force in order to take care of the disabled family member. This could be devastating to the families economic status and alternative solutions must be sought. Nursing home placement does not adequately meet the needs for our patients and our mission. Low cost respite day programs would be a viable alternative. Funding could be again, from third party payors, families themselves with sliding scale fees and community and Foundation support. This would fill another gap in the service delivery system for catastrophically injured patients in the Houston/Galveston area.

 VOCATIONAL SERVICES

The population of TIRR has changed over the past decade from being a mix between paraplegic and quadriplegic to being a mix of quadriplegic and brain injured patients. The development of a strong, innovative vocational program that takes this different patient mix into account is necessary. Again, if we are looking at case management across the continuum, we need to look at vocational services across the continuum and look at alternative forms of vocational services including, but not limited to sheltered employment, supported employment, enclave employment and an affirmative action industry. All of these have viable funding sources within the state's Texas Rehabilitation Commission, but more importantly allow disabled people to enter the work force in a controlled environment so that they may branch out (when they are ready) into competitive employment. With the passage of the Americans' With Disability Act (ADA), TIRR should take a leading role in this law in interpreting what this law will mean to our patients, families, sponsors and the employers within the community. We can certainly assist with interpretation, but also in lending expertise to employers in getting our patients back in the work force.

The President's Committee On Employment Of People's With Disabilities has found that 88% of the cases, companies can accommodate a disabled employee for less than \$1,000.00 by installing simple devices and improving the work place to be barrier-free. The New York Times recently reported that the turn over among people with disabilities is so low that companies can often justify even higher cost of modifying the work place. Rehabilitation facilities which frequently hiring their own patients, have found even the profoundly disabled to be excellent long-term employees. Some of our outstanding employees at TIRR are so of our own patients we have rehabilitated. This sets an excellent example within the community and should be capitalized on as one of our strengths. Vocational services needs to take a leading role in the 90's and beyond so that disabled people are given every opportunity to return work and that employers are educated as to what the needs of disabled people are.

HOME HEALTH SERVICES

Just as in-hospital days are being cut, at-home services have increased. A number of providers in the Houston area have tried to provide comprehensive rehabilitation services in the home and lack of expertise. This has been an important development, especially for elderly stroke patients, but will play an exceedingly more important role as we see more catastrophically injured children and young adults return to home needing continued services. We refer a substantial number of our patients for home health services and it would be wise to look into the feasibility of the development of our own such services here at TIRR. We may want to look to the development of home evaluations for our patients as a first step (i.e., our therapists and/or nurses travel to patients' homes). Third party payors, including Medicaid and Medicare helped support these services and many of our patients could benefit from such services.

OUTREACH PROGRAM

TIRR has been providing services primarily to the Houston/Galveston area, however, we have been internationally recognized as a facility for the treatment of severely injured patients. Unfortunately, once the patient's leave our environment, there is no good mechanism to continue to provide outreach services to those patients outside of our area. The development of residential "Ronald McDonald type" apartments will help bring in patients for evaluation and visits and ease the transition between hospital, home and distant home. But we need to look at providing expertise and perhaps even outreach clinics to not so far away places, like Bryan College Station and Galveston, Texas where physiatrists currently do not practice. There is the potential to develop other referral networks within the Houston/Galveston Southeast Texas, Western Louisiana area. These ties should be strengthened and developed.

cc: Lex Frieden

Traumatic Brain Injury Rehabilitation

Catherine F. Bontke, MD, and Corwin Boake, PhD†*

The introduction of helicopter evacuation with skilled emergency medical technicians has shortened the transportation time to specialized trauma centers, which has led to a dramatic increase in the number of survivors of severe traumatic brain injury. In addition, as evidenced by this issue, dramatic advances have been made in the diagnosis and neurosurgical treatment of patients with severe brain injuries, and widespread application of these advances has markedly decreased the morbidity and mortality associated with traumatic brain injury.

These changes have prompted the rapid development of dedicated rehabilitation programs for patients with traumatic brain injuries. The overall goal of rehabilitation is to reduce disability by preventing medical complications and increasing functional capacity. Traumatic brain injury rehabilitation differs from general rehabilitation because of the longer recovery course after severe

head injury, comprised of separate stages with different profiles of physical and cognitive impairments. The rational approach to traumatic brain injury rehabilitation is based on adapting treatment to the major impairments at each stage and preparing patients for the next stage of recovery.

Rehabilitation does not stop at the acute care level and therefore, rehabilitation professionals recognize the need for alternative rehabilitation programs that are not based solely on a medical model. Leaders in traumatic brain injury rehabilitation medicine and families of survivors champion the idea of the development of an integrated system of care with a common language and data system, shared technology, and specialized rehabilitation professionals.¹² Many of these concepts were implicit in the first head injury rehabilitation programs in the United States, which were established during World War II in neurosurgery departments of military hospitals.⁴

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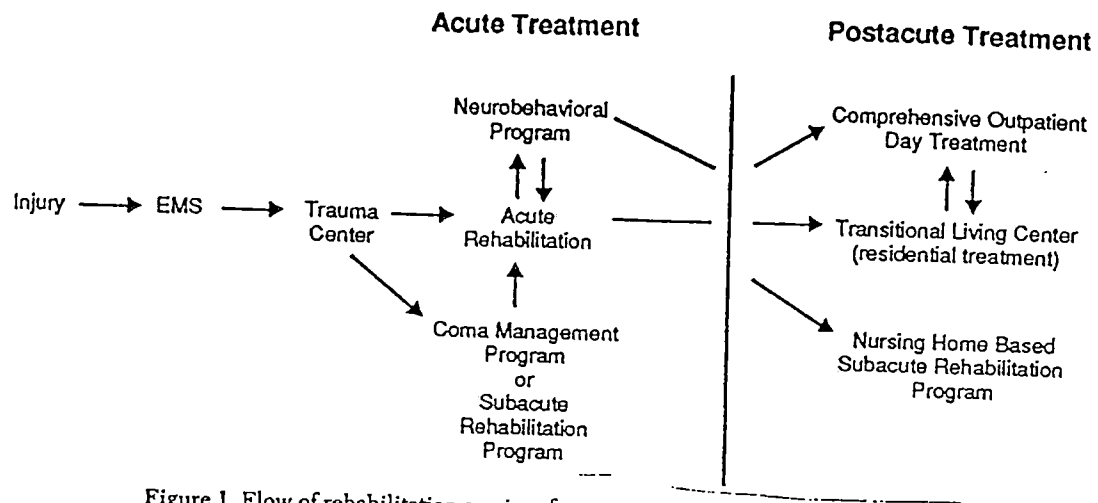


Figure 1. Flow of rehabilitation services for severe traumatic head injury patients.

REHABILITATION MANAGEMENT IN THE NEUROSURGICAL AND TRAUMA CARE SETTING

Ideally, the physiatrist (a physician specializing in physical medicine and rehabilitation) should be involved in the care of the patient with brain injury from the early days of treatment in the acute trauma unit through the inpatient rehabilitation phases of treatment to outpatient or long-term inpatient or residential care, which in severe cases extends for many months and possibly years after the injury.

Once the patient is in the intensive care unit, the priority shifts from life-saving to life-enabling treatment. The patient is evaluated for additional extracranial injuries such as fractured bones, vertebral instability, or spinal cord injury. Definitive orthopedic management of fractures often can be delayed, but early surgical treatment of orthopedic injuries frequently minimizes disability later in the patient's life.¹⁷ Infections are guarded against and if they occur are aggressively treated.

Rehabilitation efforts can start while the patient's medical and neurosurgical status is being stabilized. Patients can be positioned in ways to prevent decubitus ulcer formation, edema, and contractures. It has been noted that patients who receive passive

range of motion twice a day, unless orthopedically contraindicated, have fewer contractures.¹⁸ Aggressive, nonpharmacologic management of spasticity with the use of inhibitive casts and nerve blocks also decreases the likelihood of contracture formation.²¹ Improved attention to nutritional needs and to bowel and bladder management can prevent further disability. Family intervention with adequate information and support should begin as soon as the patient is under the care of a medical team.³⁰

Once the patient has progressed to the point of medical stability, transfer to a rehabilitation program should be facilitated. At this early stage, patient selection for rehabilitation is controversial because of the uncertain prediction of rehabilitation potential, especially in slowly recovering, unconscious patients. The preferred referral policy should be to refer all medically stable patients to rehabilitation programs for evaluation. This approach has the benefit of providing each patient with the opportunity to demonstrate potential. Unfortunately, many patients are not referred to rehabilitation programs until they can follow commands and have reached a Glasgow Coma Scale score of 8 or 9. There is evidence that patients who begin rehabilitation before 1 month after injury have shorter lengths of stay in acute rehabilitation and that this ben-

efit is not due to injury severity or medical complications.¹¹ Except where the physiatrist can evaluate the patient in acute care, direct transfer to a nursing home should be avoided because of the risks of developing complications, which can lead to further disability, and overlooking signs of improvement.

REHABILITATION PROGRAMS

There has been tremendous growth during the past 10 years in the number, types, and locations of rehabilitation programs in the United States that are specifically dedicated to the rehabilitation of patients with traumatic brain injuries. In addition, there has been an increase in the number of general rehabilitation units that provide services to patients with different diagnoses, such as stroke, hip fracture, amputation, and spinal cord injury. The National Head Injury Foundation (an advocacy organization for survivors, families, and providers) publishes a national directory of head injury rehabilitation services annually. The 1990 edition lists 283 acute inpatient rehabilitation programs, 149 programs that specifically address coma treatment, and 135 programs that provide subacute rehabilitation.²⁵ Acute rehabilitation programs are generally hospital-based rehabilitation units that provide active intense rehabilitation for short periods of time. Subacute rehabilitation programs are generally nursing home-based programs that provide less intensive therapy than acute rehabilitation programs. Coma treatment programs are specific programs for medically stable patients who are vegetative and may be subprograms of acute rehabilitation programs or subacute rehabilitation programs. Programs dedicated to traumatic brain injury generally also treat patients with other brain disorders such as anoxia and massive cerebrovascular accidents, which present similar impairments.

Even with this tremendous growth and subsequent marketing, not all patients with severe brain injuries receive rehabilitative services because of shortage of beds, lack of funding sources (especially governmental sources for uninsured or underinsured patients), geographic location of programs, and

finally because patients are simply not referred by the hospital teams that save their lives. The National Head Injury Foundation estimated in 1988 that fewer than 10% of patients with moderate to severe injuries received adequate rehabilitation services.⁶ It appears that better marketing efforts heighten awareness of the availability of services, and the very presence of such a program in the community raises the standard of care for survivors of traumatic brain injury.

Acute Rehabilitation Program

Once patients are medically stable, they can be transferred to one of several hundred acute rehabilitation programs in the United States. Many are not dedicated brain injury programs but may serve other disability categories in addition to brain injury. The programs are usually led by a physiatrist and comprise a team of professionals that may include a neuropsychologist, clinical psychologist, social worker, case manager, occupational therapist, physical therapist, speech-language pathologist, therapeutic recreation specialist, audiologist, pharmacist, dietician, rehabilitation nurse, orthotist, vocational counselor, respiratory therapist, and persons trained in pastoral care. Family members and, when appropriate, patients are considered members of the rehabilitation team.

Admission and retention in acute rehabilitation tends to be an empiric procedure, with each program following different criteria. Often patients are admitted for evaluation or for a trial of rehabilitation if they meet general admission criteria such as medical stability or ability to follow commands. Patients are retained in the program until they stop improving or can be reasonably managed on an outpatient basis. The wish to conserve patients' funding resources often plays a role in discharge.

The usual course of treatment in acute rehabilitation begins with the team evaluating the patient's strengths and deficits, establishing overall rehabilitation goals, and determining an expected length of stay. In our hospital the usual length of stay in acute rehabilitation is 1 to 3 months, with an aver-

age stay of approximately 50 days. During the admission, the team meets weekly or biweekly to update the patient's individual treatment plan and short-term goals. Even at early stages of recovery, therapies address both physical and cognitive impairments. The major therapeutic roles are usually played by physical therapists who provide transfer and ambulation training, occupational therapists and rehabilitation nurses who train patients in self-care activities, and speech-language pathologists who treat dysphagia and communicative deficits. Treatment of cognitive impairments is seen as an interdisciplinary process that follows a sequence from increasing patients' responsiveness as they recover consciousness, to increasing patients' orientation during posttraumatic confusion, and finally to increasing patients' independence in everyday activities.

Patients can be admitted to acute rehabilitation programs before regaining consciousness. However, most patients are admitted during the stage of posttraumatic amnesia (PTA) with confusion and severely impaired recent memory. Unfortunately, it is not unusual for patients to experience a phase of acute agitation as they emerge from coma and are in PTA. Agitated patients may thrash about, remove restraints, tubes, and catheters, fall out of bed, or wander away from the rehabilitation unit. Often they present a danger to themselves and others.

The underlying cause of this behavior is believed to be related to the severe confusion and lack of ongoing memory.⁶ Nevertheless, the clinician must be alert to the possibility of related contributing factors such as sleep disturbances, seizure activity, malnutrition or vitamin deficiency, or an electrolyte imbalance—potentially complicating factors that should be ruled out and, if found, treated. Conditions that may cause discomfort, such as an occult or unrecognized musculoskeletal injury or subacute infection, must be ruled out as well. Medications commonly used to control agitation, such as minor tranquilizers, neuroleptics and other central nervous system depressants, as well as antihypertensive drugs and drugs for the gastrointestinal tract, may actually increase sedation and confusion and may actually worsen agitation.

The first line of management for the agitated patient is behavioral and environmental approaches with the use of quiet, safe structured areas such as a floor bed; removal of as much noxious stimulation as possible, such as tubes, catheters, restraints, and traction; and the use of trained personnel to provide physical and verbal reassurance. When behavioral and environmental techniques do not succeed and the patient is still a danger to him or herself and to others, then pharmacologic intervention may be necessary. In recent years there has been a trend to move away from the use of sedating medications that may increase confusion, such as neuroleptics and minor tranquilizers. Sutton et al.³² has noted that neuroleptics may contribute to the underlying confusional state and have long-term side effects and thus, theoretically, may impede recovery. Minor tranquilizers may decrease the patient's ability to learn, increase memory deficits, and may have paradoxical as well as enhanced side effects in patients who have traumatic brain injuries. Psychiatrists experienced in traumatic brain injury are more apt to try carbamazepine, antidepressants, mood stabilizers such as lithium, and psychostimulants with agitated patients. If a patient's agitation is not easily controlled within an acute rehabilitation program, then transfer to a neurobehavioral unit may be indicated.

If agitation does not occur or if the patient becomes less agitated, the goals for a patient in PTA are to increase basic functions such as eating, communication, ambulation, and bowel and bladder continence as well as improve orientation. Patients change rapidly and dramatically during acute rehabilitation, and thus, therapists and clinicians evaluate patients frequently to upgrade goals and revise treatment plans. Speech-language pathologists generally do swallowing evaluations at bedside, and videofluoroscopy may be done to confirm the absence of silent aspiration and inadequate coordination in efficacy of swallowing before oral feeding is begun.⁷ Rehabilitation nurses begin bowel and bladder training programs once the patient is more aware of bodily functions. Occupational therapists, in conjunction with rehabilitation nursing, begin training in the basic activities of daily living,

which include grooming, hygiene, and feeding. Occupational therapy then advances to more complex tasks such as shopping, cooking, and money management. Physical therapists assess the patient's motor and sensory functions and begin transfer training, wheelchair training, and progressive ambulation. Neuropsychologists track cognitive recovery and help design behavioral interventions to improve patients' participation in therapy.

Once the patient has emerged from PTA, a more thorough neuropsychologic evaluation can be performed and more accurate prognostication and long-term planning can occur, especially in terms of vocational goals. Ideally, patients are discharged from acute rehabilitation once they are independent in activities of daily living and are behaviorally appropriate at home and in the community. Discharge planning involves a number of components, including the patient's physical, cognitive and behavioral limitations, available resources within the community, financial resources, the home environment, and the family support system. Family involvement throughout the acute rehabilitation program is a key to successful reintegration into the home and the community.

After acute rehabilitation, most patients benefit from continued rehabilitation and can be referred to postacute programs such as day treatment and residential treatment programs. If slow or minimal progress is anticipated, the patient may be transferred to either a subacute rehabilitation program in a nursing home, to nursing home care without rehabilitation services, or to home care with respite services such as attendant care or day care. Referral to a nursing home may also be made if the patient requires a higher level of care than can be provided in the family home.

There is a strong need for controlled efficacy studies of dedicated acute rehabilitation programs. Uncontrolled studies have shown very large improvements during acute rehabilitation,⁹ but treatment effects are confounded with the rapid spontaneous recovery after traumatic brain injury. The only efficacy study to include a nonrehabilitated comparison group found that patients who were referred for rehabilitation were much more severely injured than non-

rehabilitated patients, as measured by PTA duration. Nevertheless, rehabilitated patients had better disability and cost outcomes than predicted based on their injury severity.¹

Subacute Rehabilitation Program

Subacute rehabilitation programs are generally nursing home-based rehabilitation programs that are of lesser cost but also provide less intensive therapy. They are designed for the slow-to-recover patient or minimally responsive patient and may incorporate components of a coma treatment program as well as "slow steady" rehabilitation protocols. They generally provide less than 3 hours of therapy per day.

Coma Management and Coma Stimulation Program

Coma management programs (also termed *coma stimulation programs*) have increased in numbers in recent years despite controversy. They are usually based in skilled nursing facilities or are subprograms of hospital-based acute rehabilitation programs. The goals of coma programs are to increase consistency of response to commands, prevent complications related to immobility and malnutrition, reduce sedating medications, and educate families and involve them proactively.³⁸ The major source of controversy is the use of multimodality sensory stimulation programs. Although these stimulation therapy programs are widely used, they have not been proven to be effective in enhancing patients' ability to respond.^{23, 26, 28, 35} They are, however, an effective way to monitor patients for change and, if trained, families can be involved proactively.

A major obstacle is the absence of a standard, objective method of assessing rehabilitation progress in the vegetative patient. The Glasgow Coma Scale may be insensitive to change in slowly recovering patients once they have eye opening and sleep and wake cycles and can be classified as vegetative. Alternative observer rating scales for vegetative patients are in the process of stan-

standardization, including the Coma/Near Coma Scale (M. Rappaport, MD, personal communication, 1988) and the Sensory Stimulation Assessment Measure.²⁹ These rating scales allow clinicians to monitor vegetative patients for change and thus make decisions regarding continuation of expensive therapy.

The standard of care in coma management programs involves the removal of sedating medications. Medications that have sedating or less than desirable cognitive effects are changed or eliminated. It is not unusual for patients to be changed from phenytoin or phenobarbital to carbamazepine or valproic acid for seizure control.¹⁵ The use of medications for seizure prophylaxis following traumatic brain injury is becoming controversial. A recent randomized, double-blind study found that phenytoin was only effective in reducing posttraumatic seizures during the first week after injury and was ineffective later.³³

In addition, patients may be tried on medications to increase arousal and enhance cortical functioning. Pharmacologic classes include the dopamine agonists such as L-dopa, bromocriptine methylate, and amantadine hydrochloride; psychostimulants such as methylphenidate hydrochloride, dextroamphetamine sulfate, and pemoline; and antidepressants such as protriptyline and fluoxetine.³⁰ The use of such drugs is based primarily on animal studies that indicated enhanced recovery when the drugs were used with appropriate physical activity such as beam walking, in comparison to animals that were not medicated or were administered sedating medications and confined to small cages without physical trials.³² However, human case studies investigating enhanced cognitive functioning with the use of dopamine agonists and psychostimulants have been reported.^{16, 20}

At the very least coma management programs can provide a transition for patients and can serve a role by preventing further physical disability and lessening the chance that patients who are minimally responsive because of severe aphasia, apraxia, or limited motor control will be misdiagnosed as vegetative. Patients who regain consciousness can be referred back to acute or subacute rehabilitation programs. Patients who

do not respond should not be retained in expensive coma programs simply because funding is available. The preferred policy for patients who show no signs of progress should be to allow 6 to 8 weeks in coma management before the decision is made to discharge.

Neurobehavioral Program

The national directory of rehabilitation services by the National Head Injury Foundation lists approximately 92 programs that address behavioral disorders.²⁵ These programs are either rehabilitation facility-based, psychiatric hospital-based, or located in rural settings. The goal of neurobehavioral programs is to gain control over behavioral problems such as physical aggression and gross social inappropriateness, which prevent patients from progressing in rehabilitation or residing in the community. The major interventions are psychopharmacologic treatment and behavior modification techniques such as token economy systems. The length of stay in neurobehavioral programs may be short-term, lasting 1 to 2 months, or very long-term, lasting 1 to 2 years, depending on the patient's needs and the program's type. Patients who would benefit from this type of facility are often unmanageable in the home or community because of severe behavioral problems ranging from acute agitation, to uncontrolled substance abuse, to organic psychotic syndromes resulting from brain injury. Drug and alcohol abuse treatment can be a component of neurobehavioral programs or as a component of postacute or acute rehabilitation programs.

Although no controlled efficacy studies of neurobehavioral programs have been reported, uncontrolled studies have shown that most patients can be discharged to non-institutional settings or to less costly and restrictive institutional settings.^{8, 13}

POSTACUTE REHABILITATION PROGRAMS

At the time of discharge from acute rehabilitation, most patients with severe brain

injuries are not yet able to return to work, school, and other responsibilities. The fact that functional recovery from severe brain injury may not be completed until 1 to 2 years after injury has prompted the development of rehabilitation programs in the postacute stage. The overall goal of these programs is for patients to make a successful community reentry, including gainful employment, attendance at school, and resumption of other normal responsibilities. The basic methods of rehabilitation during the postacute stage is to increase patients' functional competence by training compensatory strategies so that patients can perform the necessary activities and skills despite permanent cognitive impairments.⁵

The term *cognitive rehabilitation* is used to refer to the branch of rehabilitation that is aimed at patients who are disabled primarily as a result of impairments in memory, judgment, and other cognitive functions. In the past few years cognitive rehabilitation has become increasingly controversial because of the proliferation of costly, time-consuming, and unproved treatments. Recent editorials in *Archives of Neurology* illustrate the divergence of opinion among experts in neurologic rehabilitation.^{3, 22, 36} However, there is a consensus that research evidence of the effectiveness of cognitive rehabilitation is at best preliminary. The major source of controversy appears to be the use of computer exercises and other repetitive tasks in an attempt to restore impaired cognitive functions. In fact, there is no evidence that computer training generalizes to everyday functioning,³ and evidence of improved cognitive test performance following computer training may simply reflect practice effects between similar tasks.¹⁹ There is, however, clear evidence that patients can improve their functional abilities through compensatory strategies and can, for example, be retrained to return to work or school.^{2, 27, 37} Unfortunately, without follow-up services, many patients fail to generalize or maintain these initial improvements.^{2, 6, 27}

In the absence of research support, referral of patients to cognitive rehabilitation programs should be made on an individual basis, depending on the patient's potential and the program's ability to help the patient

Table 1. Chronic Care Options for Severe TBI Patients

Outpatient follow-up services
Day care
Supported employment
Sheltered employment
Group home/life long living center
Nursing home
Specialized college programs
Respite care programs
Support groups for patients and families

reach realistic goals. Patients should generally be referred to programs that can provide comprehensive rehabilitative services rather than cognitive rehabilitation alone and that are directed toward tangible goals such as employment or independent living.²⁴ The patient's level of cognitive and behavioral functioning is usually the major factor in outcome and can be used to determine realistic goals.¹⁴

Day Treatment Program

The most common type of postacute program is the day treatment program. The major goal of day treatment programs is to increase patients' independence and safety in the community, and, in some programs, to assist patients in returning to employment or school. The typical day treatment program is affiliated with an acute rehabilitation program but may be located in a community setting such as a shopping center or office building. The program staff consists of different rehabilitation therapists, with the major responsibilities carried by speech therapists, who provide cognitive retraining, occupational therapists for activities of daily living, vocational counselors for job placement, and psychotherapists for counseling to patients and families. Therapists are usually assigned to the program full time to develop the necessary expertise and teamwork. The staff may also include a case manager, often a social worker, who is responsible for coordinating services and communicating with referral sources, families, and payors.

The course of treatment in a day program usually begins with an evaluation stage,

including a neuropsychologic evaluation, to determine the patient's current level of functioning, major impairments and strengths, and realistic goals. Patients may attend the program for up to 6 hours per day, 5 days per week. The therapy schedule consists of a mixture of therapies to train cognitive and functional skills, together with therapies to improve social behavior and awareness of deficits. The length of stay in the program can range from 3 months to 1 year, depending on the patient's needs and goals. Programs offering employment services may provide job trials in which patients are assigned to worksites in an unpaid capacity, followed by placement in paid jobs. An increasingly popular model for vocational rehabilitation is supported employment, in which the patient is placed in a paid job and supervised at the jobsite by a job coach who is gradually phased out as the patient learns to perform the work responsibilities more independently.³⁷

The most difficult discharge scenario is presented by severely injured patients who function below the level required for employment or school. Placement in sheltered workshops or day care centers designed for mentally retarded or mentally ill patients is usually unsuccessful. There is a strong need to develop long-term rehabilitation and respite programs for this subgroup of patients.

Residential Treatment Program

Patients who require basic living skills training and intensive 24-hour structure may be referred to residential treatment programs. The goal of residential programs, also termed *transitional living centers*, is to increase patients' level of independence in order to live independently or with less supervision. Residential programs are typically housed in large homes or dormitory-style buildings. The preferred location is in a residential area, close to community resources such as public transportation and shopping centers. The average capacity of residential programs is 18 patients.⁵ The staff usually consists of a team of rehabilitation therapists, supplemented by recreational therapists and paraprofessional personnel who supervise activities during evenings and

weekends. Patients reside in the program full time, with an average stay of 12 months.⁵ The treatment program consists mostly of direct training in living skills with additional physical, speech, and other therapies as needed. In better residential programs, patients can move to more independent housing as their level of independence improves. For example, patients may be placed in their own apartments outside the program site during the period leading up to discharge.

COST-EFFECTIVENESS AND QUALITY

In the current reimbursement environment, the cost-effectiveness of traumatic brain injury rehabilitation is an increasing concern and may affect patient selection for rehabilitation. Acute rehabilitation programs are cost-effective to the extent that patients can avoid long-term institutional placement or require less supervision. When compared to institutional placement, for example in nursing homes, acute rehabilitation can result in considerable cost savings.^{1, 10} Postacute programs are cost-effective if patients can return to gainful employment,³¹ although the cost savings may apply mostly to disability income supports. For many patients who live at home, the major benefits of rehabilitation are to improve quality of life and to reduce family burden.

Quality of rehabilitative services has become a significant issue in patient referral and funding, in part because of the rapid proliferation of brain injury rehabilitation programs. Although the Commission on Accreditation of Rehabilitation Facilities sets minimum standards for brain injury rehabilitation programs, not all programs choose to undergo accreditation and the rapidity with which programs are established makes lack of experience a factor in some programs. The National Institute for Disability and Rehabilitation Research Model Systems Program has designated five federally supported centers that research cost-effective treatment and minimization of disability following traumatic brain injury.³⁴

SUMMARY

Improved survival from severe traumatic brain injury has prompted the development of dedicated rehabilitation programs. Ideally, rehabilitation should begin during acute care in order to prevent later complications. Medically stable patients should be referred from acute care to acute rehabilitation programs for evaluation and then treatment or transfer as appropriate. Dedicated brain injury rehabilitation programs follow a method in which treatment is adapted to the major physical and cognitive impairments at each stage of recovery. Specialized treatment protocols have been developed for unconscious or agitated patients, partly on the basis of advances in neuropharmacology. Because of the long recovery course after severe brain injury, many patients are appropriate for postacute rehabilitation programs directed at community reentry, including return to work. Newer program models for patients with traumatic brain injuries, especially programs using cognitive rehabilitation techniques, are controversial because of inadequate research support and uncertain cost-effectiveness.

REFERENCES

1. Aronow HU: Rehabilitation effectiveness with severe brain injury: Translating research into policy. *J Head Trauma Rehabil* 2(3):24-36, 1987
2. Ben-Yishay Y, Silver SM, Piasetsky E, et al: Relationship between employability and vocational outcome after intensive holistic cognitive rehabilitation. *J Head Trauma Rehabil* 2(1):35-48, 1987
3. Berrol S: Issues in cognitive rehabilitation. *Arch Neurol* 47:219-220, 1990
4. Boake C: A history of cognitive rehabilitation of head-injured patients, 1915 to 1980. *J Head Trauma Rehabil* 4(3):1-8, 1989
5. Boake C: Transitional living centers in head injury rehabilitation. In Kreutzer JS, Wehman P (eds): *Community Integration Following Traumatic Brain Injury*. Baltimore, Paul H. Brookes, 1990, pp 115-124
6. Bontke CF: Medical advances in the treatment of brain injury. In Kreutzer JS, Wehman P (eds): *Community Integration Following Traumatic Brain Injury*. Baltimore, Paul H. Brookes, 1990, pp 3-13
7. Bontke CF: Medical complications related to traumatic brain injury. In Horn LJ, Cope DN (eds): *Traumatic Brain Injury*. Philadelphia, Hanley and Belfus, 1989, pp 43-58
8. Burke WH, Wesolowski MD, Cuth ML: Comprehensive head injury rehabilitation: An outcome evaluation. *Brain Inj* 2:313-322, 1988
9. Carey RG, Seiberg JH, Posavac EJ: Who makes the most progress in inpatient rehabilitation? An analysis of functional gain. *Arch Phys Med Rehabil* 69:337-343, 1988
10. Cope DN: Traumatic closed head injury: Status of rehabilitation treatment. *Semin Neurol* 5:212-220, 1985
11. Cope DN, Hall K: Head injury rehabilitation: Benefit of early intervention. *Arch Phys Med Rehabil* 63:433-437, 1982
12. Dixon TP: Systems of care for the head injured. In Horn LJ, Cope DN (eds): *Traumatic Brain Injury*. Philadelphia, Hanley and Belfus, 1989, pp 169-181
13. Eames P, Wood RL: Rehabilitation after severe brain injury: A follow-up study of a behavior modification approach. *J Neurol Neurosurg Psychiatry* 48:613-619, 1985
14. Fryer LJ, Haffey WJ: Cognitive rehabilitation and community readaptation: Outcomes from two program models. *J Head Trauma Rehabil* 2(3):51-63, 1987
15. Glenn MB, Wroblewski B: Update on pharmacology: Anticonvulsants for prophylaxis of post-traumatic seizures. *J Head Trauma Rehabil* 1(1):73-74, 1986
16. Gualtieri CT: Pharmacotherapy and the neurobehavioral sequelae of traumatic brain injury. *Brain Inj* 2:101-129, 1988
17. Hanscom DA: Acute management of the multiply injured head trauma patient. *J Head Trauma Rehabil* 2(2):1-12, 1987
18. Kottke FJ: Therapeutic exercise to maintain mobility. In Kottke FJ, Stillwell CK, Lehmann JF (eds): *Krusen's Handbook of Physical Medicine and Rehabilitation*, ed 3. Philadelphia, WB Saunders Co., 1982, pp 389-402
19. Kreutzer JS, Gordon WA, Wehman P: Cognitive remediation following traumatic brain injury. *Rehabilitation Psychology* 34:117-130, 1989
20. Lal S, Merbitz CP, Grip JC: Modification of function in head-injured patients with Sinemet. *Brain Inj* 2:225-233, 1988
21. Lehmkuhl LD, Thoi LL, Baize C, et al: Multimodality treatment of joint contractures in patients with severe brain injury: Cost, effectiveness, and integration of therapies in the application of serial/inhibitive casts. *J Head Trauma Rehabil*, in press
22. Levin HS: Cognitive rehabilitation: Unproved but promising. *Arch Neurol* 47:223-224, 1990
23. Mitchell S, Bradley VA, Welch JL, et al: Coma arousal procedure: A therapeutic intervention in the treatment of head injury. *Brain Inj* 4:273-279, 1990
24. Namerow NS: Current concepts and advances in brain injury rehabilitation. *J Neuro Rehabil* 1:101-114, 1987
25. National Head Injury Foundation: National Directory of Head Injury Rehabilitation Services, 1990 ed. Southborough, MA, National Head Injury Foundation, 1990

26. Pierce JP, Lyle DM, Quine S, et al: The effectiveness of coma arousal intervention. *Brain Inj* 4:191-197, 1990
27. Prigatano GP, Fordyce DJ, Zeiner HK, et al: Neuropsychological rehabilitation after closed head injury in young adults. *J Neurol Neurosurg Psychiatry* 47:505-513, 1984
28. Rader MA, Alston JB, Ellis DW: Sensory stimulation of severely brain injured patients. *Brain Inj* 3:141-147, 1989
29. Rader MA, Ellis DW: Sensory Stimulation Assessment Measure. Camden, Mediplex Rehab-Camden, 1989
30. Sandel ME: Rehabilitation management in the acute care setting. In Horn LJ, Cope DN (eds): *Traumatic Brain Injury*. Philadelphia, Hanley and Belfus, 1989, pp 27-41
31. Sohlberg MM, Brock MS: Taking the final step: The importance of post-medical cognitive rehabilitation. *Cognitive Rehabilitation* 3(5):10-13, 1989
32. Sutton RL, Weaver MS, Feeney DM: Drug-induced modifications of behavioral recovery following cortical trauma. *J Head Trauma Rehabil* 2(4):50-58, 1987
33. Temkin NR, Dikmen SS, Wilensky AJ, et al: A randomized, double-blind study of phenytoin for the prevention of post-traumatic seizures. *N Engl J Med* 323:497-502, 1990
34. Thomas JP: The evolution of model systems of care in traumatic brain injury. *J Head Trauma Rehabil* 3(4):1-5, 1988
35. Timmons M, Gasquoin L, Scibak J: Functional changes with rehabilitation of very severe traumatic brain injury survivors. *J Head Trauma Rehabil* 2(3):64-73, 1987
36. Volpe BT, McDowell, FH: The efficacy of cognitive rehabilitation in patients with traumatic brain injury. *Arch Neurol* 47:220-222, 1990
37. Wehman P, Kreutzer J, West M, et al: Employment outcomes of persons following traumatic brain injury: Pre-injury, post-injury, and supported employment. *Brain Inj* 3:397-412, 1989
38. Whyte J, Glenn MB: The care and rehabilitation of the patient in a persistent vegetative state. *J Head Trauma Rehabil* 1(1):39-53, 1986.

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MEMORANDUM

DATE: July 1, 1991

TO: Louisa Adelung
Charles Beall
Bonnie Brooks
Mary Koch
Attending Physicians

RE: Summary Casa Colina Visit
A Physiatriatric Perspective

FROM: Lawrence J. Horn, M.D.

I. Variables affecting the applicability of the Casa Colina continuum of care to TIRR.

1. Both Casa Colina and TIRR are affected by Nursing and Therapy shortages, although it would appear that the shortages are slightly more problematic in Houston. One of the solutions developed at Casa Colina may be applicable and will be discussed below:
2. The effect of managed care is quite prominent in California and while there is virtually none that we must deal with at the present time here, this kind of cost-saving approach is certainly coveted by many payors for services throughout the Country, and it would not be surprising if within the next couple of years TIRR would need to adapt to this kind of payment system.
3. The level of endowments and fund raising is certainly exemplary at Casa Colina, and perhaps an area where TIRR might improve.
4. It was very clear, both for the subacute program and the brain injury and spinal cord programs that the patients accepted by Casa Colina are almost completely medically stable. This is in direct contra-distinction to the types of patients normally accepted for admission to TIRR. This level of medical stability has a direct impact on length of stay, ability of the patients and clients to participate in the rehabilitation process and is reflected in the FIM scores the national rating for which Casa is so proud.
5. Perhaps as a reflection of relative shortage of physiatrists in the past, the model that Casa Colina has developed has less emphasis on the physicians and perhaps more emphasis on specific program development.

II. SubAcute Facilities

1. The model used currently by Casa Colina is almost diametrically opposed that which we are suggesting for our subacute facility. As in Virginia, the subacute program is used to prepare patients for entry into acute rehab or other components of their continuum of care. It seems to be designed to allow service delivery to patients who are medicare ineligible for acute rehabilitation due to their inability to participate in three hours of therapy. This raises questions as to whether or not we can adopt a similar model (even though we are not targeting Medicare) given our hospital licensure as opposed to SNF licensure. We will be doing this as part of our management program for comatose or vegetative patients after medical stability is achieved in the acute rehabilitation component which would hopefully take no more than a month.

III. Continuum of Care - Global Issues

1) Global Issues:

- a) Casa Colina does provide many components in the continuum of care for traumatic brain injury and for spinal cord injury. It is not, from my perspective a system of care, however, as it specifically lacks direct connections with an acute care component, and in spite of their administrative case management, from a clinical perspective there is no significant case management from the client's perspective. In other words, there is no central base where social, medical and psychological assessments can be performed such as regular outpatient clinic which has direct ties into the system of care.
- b) Developing Programs. Interesting and innovative programs are being contemplated at Casa Colina which directly reflect California law, such as the CLIF Program. The applicability of these programs here would be in large part dependent on some more liberal thinking on the part of our legislators in Austin.
- c) Inpatient Programs. Currently the inpatient brain injury program uses Roger Wood's neurobehavioral model. In this setting the therapists and nurses co-treat and in fact the patient is followed around

from one therapy area to another by his nursing staff and other therapists, rather than being shuttled from one place to another. As a result, other than for medical reasons, the patients spend very little time around the rooms or on the nursing unit per se. This intervention strategy is quite avant garde. While conducive to interdisciplinary practice, it may not be directly applicable to TIRR. To my knowledge no other facility in the country uses this specific model, and there is at this time no clear-cut evidence that this model is necessarily more cost-effective than other ways of providing improved interdisciplinary rehabilitation. It does allow a framework in which the therapists and nursing staff seem to be quite comfortable at the present time.

- d) Also noted and applicable to brain injury, spinal cord injury, and "comprehensive rehabilitation" is the specific team approach. Apparently they designate therapists to specific programs in a much more direct level than is currently done at TIRR i.e., there are specific therapists for brain injury, specific therapists for spinal cord injury, and then specific therapists for the mixed disability patients which at Casa Colina would include amputees, orthopedic injuries, etc. Currently the groupings as to specificity at TIRR are much larger with basically two divisions rather than the three or four divisions including pediatrics that would have emanated from the Casa Colina model. Beyond this, the specificity at Casa is even more pronounced in that there are teams of therapists that consistently work together and generally consistently work with the given physician. Therefore, when a patient is admitted to the institution they will be assigned to a team that is able to schedule the person for therapies independent of the other teams or the hospital as a whole; this permits significant flexibility in terms of attendance at team conferences and the ability to modify the schedule for outside evaluations, etc. It seemed quite obvious that scheduling was not a problem at Casa Colina.
- e) Treatment plans were reflective of interdisciplinary process and also reflective of the neurobehavioral model using specific localizations of injuries, impairments and disability; then the goals that resulted were developed from the disability/impairment problem list.

- f) The "nursing" rehabilitation technicians or Aides were cross-trained by physical, occupational and speech therapists so that they became interdisciplinary rehabilitation technicians. As a result in the mornings they might assist nursing with hygiene and basic ADLs and then would assist in the therapy areas, where necessary as well.
- g) Post Acute Rehabilitation Programs. The Post Acute Rehabilitation programs were primarily devoted to traumatic brain injury. These represented an excellent continuum of care. These included one of the most remarkable transitional living facilities I have seen. They also have life care programs or long-term supervised living programs. They also have the adult activity program which is not a major money maker for the organization, but was socially responsive in providing respite for family members and also a mechanism for some service delivery to people in supportive living. This was directly adjacent physically to their day hospital program, so that individuals who basically need day activity with some supplementary therapy could avail themselves of these services provided at the day hospital.

IV. Implications for TIRR and the Use as a Model.

1. Things we can do now.

- a) Enhance our fundraising strategies. The administrator for Casa Colina gave some suggestions on how our administration can enhance our skills at fundraising.
- b) Evaluate whether or not we can or should do pre-acute rehabilitation in our subacute facility while we are still hospital-based. This would still require higher levels of medical stability coming from the referral hospitals than our current referrals reflect in order to be cost-effective.
- c) Restructure inpatient and outpatient services within the institution to enhance the program orientation in our matrix hierarchy. This may follow the "centers of excellence" model. The specific centers of excellence could be brain injury, spinal cord injury, amputee (if the numbers permit), pediatrics, and a "comprehensive rehabilitation" or "mixed disability" service that

would include elderly stroke and other geriatric populations, burns, orthopedic or other neurological conditions and might even include amputees on an inpatient basis. An outpatient center of excellence would be performing arts and sports medicine.

2. This would necessitate more clearly and specifically designating treatment teams in each discipline including medicine for these "centers of excellence". One could adopt the Casa Colina model with specific individualized treatment teams that always work together, or utilize mid-managers in each discipline that are specific to given programs (e.g., TBI, SCI, Amputee, Pediatrics and mixed disability as specific entities in programs).

Also consider obtaining outside consultants (Tom Dixon, Ph.D.) to help develop interdisciplinary process and the organizational infrastructure attendant to it at TIRR.

3. This would also involve a decentralization of scheduling so that a patient's therapy day could be scheduled by individual case managers and members of a program treatment team. This would allow greater flexibility so that the treating therapists could participate in the interdisciplinary process of team conference and would allow flexibility in scheduling therapies around any outside appointments. Scheduling for outside appointments could be done by the unit clerks. Outpatient scheduling for appointments could be done through the outpatient scheduling system. Not only does this kind of structure permit greater flexibility in scheduling, attendance at team conferences, but it also allows for the rotation of therapies by the department heads so that other services could be covered based on census or staffing needs.
4. Investigate the ability to cross-train rehabilitation technicians and nursing aides in other disciplines
5. Reevaluate funding for continuing educations for all health disciplines and enhance that funding as needed. The target for funding should be specific education in program related skills and knowledge for a given discipline.

Currently the nationally recognized individuals from TIRR for spinal cord injury and brain injury are the physicians. We should attempt to develop nationally recognized experts in physical therapy, occupational

therapy, speech pathology, recreational therapy, etc. for TBI, SCI, or Pediatrics, etc. In addition to targeting specific education in TBI therapies, SCI therapies, etc., we could also consider the following strategies:

- a) Bring in outside "experts" to work with a given program or center of excellence's team for a day or two to develop specific skills related to that program or center. To offset costs for bringing in these experts, they could be requested to give an open lecture that we would make available to the community and then charge a small amount for attendees outside of TIRR. Although this may not completely offset the cost for bringing experts, the experience at Magee is that it is a significant contributor. This results in the ability to provide really high quality ongoing education at a fairly low cost. This would also support the concept of developing TIRR as an exciting intellectual and academic environment, may have implications for staff retention.
 - b) The other possibility is to use clinicians from a given center or program of excellence to staff booths and market the program at national conferences related to the program (e.g., have clinicians from the traumatic brain injury program staff the booth at the NHIF Conference). Usually conferences will give a reduced charge for attendance to exhibitors and we can use this to good advantage.
- V. Designate outpatient therapists and liaison marketing nurses along programmatic lines or as part of a rotation within a program.
- VI. Reorganize the clinics as lifetime follow up/case management's central core. This would allow proactive rather than reactive interventions with our patients. It would enhance the nursing role, but would require new RNs with either home health or rehabilitation experience, or experience in case management to work jointly with the current social work case management. It would entail the clinic being less of a doctor's office model and more of an interdisciplinary rehabilitation model. This is a needed service not suggested by Casa Colina structure, but anticipates the development of other programs and needs for system coordination.

VII. Long-Term Planning and Strategies:

1. Develop a "Mega Challenge" program or day hospital program that would be able to effectively manage more involved patients from a medical or physical perspective.
2. The Casa model of having an associated day activity program seems quite wonderful and should be contemplated as well. Again, the day activity program may not be a major money maker, but does permit caregivers to drop off the patient through the bulk of the day allowing them to pursue competitive employment, especially since most of the clients who would use that service would never be capable of employment (socially responsible).
3. Develop transitional living programs that can deal with a variety of levels of ability and disability dependent on cognitive behavioral and physical issues (in part some of these could be delivered by a new subacute facility off-site depending on its licensure, please see my previous recommendations for the kinds of programs that could be developed in said facility).
4. Consider developing a life-care or supervised living program such as Casa's ranch programs or "urban suburban" program. One might even consider joint venturing this kind of thing with other organizations.
5. Develop comprehensive home services whereby an interdisciplinary team, complete with team conferences, etc. goes to the patient's home to provide intensive rehabilitation services in that environment.
6. Re-develop vocational services to be integrated into inpatient and outpatient programs at TIRR. I realize that this was not a successful venture in the past, but may have reflected personalities rather than a lack of need for the service. Again, this may or may not be a money maker for the facility, but is a needed component to comprehensive rehabilitation.