INTRODUCTION:
The National Spinal Cord Injury Statistical Center (NSCISC) supervises and directs the collection, management and analysis of the world’s largest spinal cord injury (SCI) database. This SCI database contains over 25 years of information gathered on patients with spinal cord injuries who were treated by one of the federally funded Model SCI Care Centers located regionally throughout the United States.

Because the NSCISC is home for the national spinal cord injury database, the Center serves as the primary source for ongoing, database-oriented research. Researchers use the database to examine factors related to SCI. Many of the results from these studies have had a significant impact on both the nature and delivery of medical rehabilitation services for persons with SCI.

DESIGN:
This research project examined the NSCISC database to document recent trends in spinal cord injury rehabilitation practices and outcomes. An analysis was done on data from 3,082 patients with SCI who were treated and discharged by a Model SCI Center between 1995 and 1999. The specific areas of focus included:

1. The average length of inpatient rehabilitation stay
2. The use of outpatient rehabilitation services
3. The treatment outcomes

LENGTH OF REHABILITATION STAY:
The NSCISC began tracking the average length of inpatient rehabilitation stays of patients with spinal cord injury in 1974. At that time, the average length of inpatient rehabilitation stay for patients in Model SCI Centers was about 127.3 days. Over the next 20 years, NSCISC recorded a steady decline in that average. By 1986, the length of rehabilitation stay steadily dropped 36% to an average of 81.5 days. By 1994, the length of inpatient rehabilitation stay had fallen 57% from the 1974 level to an average of 54.6 days.¹

![Graph 1: Average Rehabilitation Length of Stay](image)

As Graph 1 shows, however, the declining trend in the average length of inpatient rehabilitation stay ended between 1995 and 1999. In fact, the length of stay was virtually constant over that 5 year period averaging almost 52 days.

OUTPATIENT REHAB SERVICES:
When outpatient rehabilitation services from 1995 through 1999 were examined, it was found that almost 93% of patients who were prescribed services actually received...
outpatient treatment following their discharge from a Model SCI Center. The data also showed that only about 24% of patients received some outpatient rehabilitation services in 1995, and only about 3% received more than 100 hours of services. In each of the next 4 years, those percentages steadily increased. By 1999, close to 75% of patients received outpatient rehabilitation services following their discharge, and almost 24% received more than 100 hours of services.

**TREATMENT OUTCOMES:**

The treatment outcomes of all patients in the study group were evaluated to document the progress of patients. Outcome measures were recorded at the time of discharge from inpatient rehabilitation and at one year after discharge. These outcomes measures were based on observed data reported by professionals and self-reported data by the patients.

The Functional Independence Measure (FIM) was used to assess various aspects of each patient's motor function associated with specific activities. A few of these activities include transferring, feeding, and personal grooming. The Motor FIM scores of patients at discharge were compared to the Motor FIM scores recorded one year after discharge to measure the total gain in Motor FIM scores for all patients. The mean (x) results are below.

**Motor FIM Scores by Outpatient Rehab Hours**

<table>
<thead>
<tr>
<th>Hours</th>
<th>Discharge FIM Scores</th>
<th>Annual FIM Scores</th>
<th>Total Gain FIM Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>58.1</td>
<td>64.2</td>
<td>6.3</td>
</tr>
<tr>
<td>1-5</td>
<td>57.5</td>
<td>61.4</td>
<td>3.4</td>
</tr>
<tr>
<td>6-20</td>
<td>60.0</td>
<td>66.0</td>
<td>5.3</td>
</tr>
<tr>
<td>21-40</td>
<td>60.7</td>
<td>68.6</td>
<td>8.4</td>
</tr>
<tr>
<td>&gt;40</td>
<td>52.7</td>
<td>62.5</td>
<td>10.4</td>
</tr>
</tbody>
</table>

Discharge FIM p<.0001  Annual FIM p=.11  FIM gain p<.0001

The results show that patients not receiving outpatient rehabilitation services following discharge averaged a total gain of 6.3 in their Motor FIM score after one year. Patients who received between 1 and 20 hours of outpatient services showed an average total gain of no greater than 5.3 in their Motor FIM score. Patients receiving between 21 and 40 hours of services averaged a total gain of 8.4 in their Motor FIM, whereas the greatest total gain in Motor FIM score was 10.4 by patients who received more than 40 hours of outpatient rehabilitation services after discharge.

Three assessment measures were used to document life satisfaction and self-reported health. Measure 1 asked patients to rate their health condition as either excellent, good, average, fair, or poor. Measure 2 asked patients to answer 5 questions rating their life satisfaction on a scale of 1 to 5. Measure 3 was the Craig Handicap Assessment and Reporting Technique (CHART).

**Summary:**

Inpatient rehabilitation lengths of stay remained constant from 1995 through 1999. During that 5 year period, the percentage of patients receiving outpatient rehabilitation services increased along with the percentage of patients receiving more than 100 hours of outpatient services. Although patients' life satisfaction and self-reported health were not affected one year after discharge, Motor FIM and CHART scores were higher for patients who received up to 40 hours of outpatient services after they were discharged from Model SCI Centers.

**Notes:**


Michael J. DeVivo is the NSCISC Director and Professor at the University of Alabama at Birmingham Department of Physical Medicine and Rehabilitation.