To determine areas most commonly evaluated by occupational therapists and to ascertain methods in which evaluative information is gathered, 35 evaluation forms currently employed by occupational therapists to assess dysfunction in patients with cerebral vascular accident were collected. Five general areas including motor function, sensory deficit, hand function, activities of daily living, and visual perception were found to be most frequently listed on the forms. These areas were divided into sub areas to operationally define the information collected. Analysis revealed that the level of measurement most frequently employed by therapists to record evaluative findings was the descriptive level. There was a tendency to collect data at "higher" or more sophisticated levels of measurement in those areas evaluated most frequently. The findings are discussed in relation to professional competency concerns and the need to develop unique occupational therapy evaluative instruments for areas of practice such as cerebral vascular accident.

Cerebral Vascular Accident: Some Characteristics of Occupational Therapy Evaluation Forms

(stroke, evaluation, hemiplegia)

Kenneth Ottenbacher

The largest single diagnosis evaluated and treated in occupational therapy clinics for the adult physically disabled is hemiplegia secondary to cerebral vascular accident (CVA) (1). Rusk (2) stated that hemiplegia following CVA should not be considered a specific clinical entity but rather a functional deficit with variations in the "hemiplegic pattern." According to Rusk (2) there is no "standard program for the rehabilitation of hemiplegic patients. Instead, the prescription of treatment must be based on the specific functional deficits in the patient." (p 601) To determine specific functional deficits requires succinct evaluation. Professional competency concerns and the need to facilitate empirical research in occupational therapy and related rehabilitation fields have emphasized the need for more formal and standardized evaluation procedures in areas of occupational therapy practice (3, 4).

Smith and Tiffany state that evaluation in occupational therapy is the "process of collecting and organizing the relevant information about a patient or client so that the therapist will be able to plan and implement a program of treatment that can be meaningful and effective." (5, p 151) They identify the first step in the evaluation process as the collection of data. However, for a disorder as variable as CVA, the first step is to identify what data to collect. Dysfunction resulting from CVA may be manifest in a variety of ways including: neuromotor paresis, sensory deficits, visual impairment, communication disorder, intellectual dysfunction, and perceptual deficits. Impairment in all or any of the above areas may lead to functional deficits in the individual's life pattern.

The objectives of this investigation were to 1. identify the areas of function or dysfunction most frequently included in formal CVA evaluation forms used by occupational therapists treating CVA patients; 2. to determine the proce-
Procedures and Results
To determine the current areas of concern in occupational therapy evaluation of CVA patients, occupational therapy departments in rehabilitation centers and hospitals were requested by mailings and via the Physical Disabilities Specialty Section Newsletter, published by the AOTA, to submit copies of current evaluation forms and protocols for evaluating CVA patients. Thirty-five centers from 28 states returned evaluation forms. All centers currently treat adult CVA patients and employ at least one full-time occupational therapist.

The first task in collating the evaluation information received was to identify areas of function or dysfunction commonly included in CVA evaluation forms. Tabulation of the different areas of evaluation included on each of the forms submitted revealed nine areas of common concern, which included: motor function, sensory perception, daily living, visual perception, muscle tone, hand function, ADL, behavioral/aphasia, and sensory integrative.

To further clarify and operationally define what was evaluated, each general area was broken down into sub areas. For example, in the area of motor function the most commonly evaluated sub area was muscle tone. Ninety-one percent of all motor evaluations of CVA included some method of measuring muscle tone. Table I lists the sub areas and accompanying percentages for the five most commonly evaluated general areas of function: motor, sensory, hand function, ADL, and visual perception. Further data from sub areas for the remaining six areas of evaluation may be obtained from the author.

The above analyses provided descriptive information regarding areas most commonly included in specific CVA evaluation forms used by occupational therapy clinicians but yielded little information on how each area was measured.

Data gathered from any source may be of several different "levels." The level of data or measurement is important in establishing the reliability and validity of the instrument, and in determining the type of statistical procedures that may be employed to analyze the data (6). For purposes of this investigation six levels of data were defined as adapted from Gay (7). They are described below:

Descriptive (Des): Descriptive data are the "lowest" or least reliable level of measurement. Evaluations that use a descriptive level of measurement require only a subjective description of the patient's ability or impairment. For example, for the muscle tone component of the motor section of the evaluation, the therapist subjectively describes the patient's tone in his/her own words.

Nominal (Nom): Nominal level data categorize or classify information. The classifications are exclusive and do not imply any degree of quality. That is, one classification is not better nor worse, larger nor smaller, than any other. For example, disorders of muscle tone might be classified as spastic, flaccid, or mixed. If the nominal level contained a written protocol that helped the evaluator to decide in which category the patient belonged, it was referred to as nominal/protocol (Nom/P).

Ordinal (Ord): Ordinal level information ranks data in terms of the degree to which they possess a characteristic of interest. Ordinal level measurement infers one score is in some way better than another. For example, in ranking the muscle tone component of the motor evaluation, spasticity might be ranked as severe, mild, moderate, or absent. The ranking is by degree with the implication that severe spasticity is the least desirable condition and the absence of spasticity the most desirable. If the ordinal level was accompanied by a written protocol providing information for making evaluative judgment, it was labeled ordinal/protocol (Ord/P).

Interval/Ratio (Int/Ratio): The interval/ratio level of measurement is the "highest" or most reliable level of measurement. The distance between any two scores is the same across all scores. Some authorities differentiate between interval and ratio levels by stating that the ratio level contains an absolute zero and the interval level does not. For the purpose of this study the two levels were combined. An example of interval/ratio measurement would be range of motion measurement with a goniometer. The distance or interval between 10° and 15° is the same as that between 20° and 25°. Many statistical procedures are only appropriate for use with interval-level data and should not be used with "lower" levels of measurement.
Table 2 lists the 11 general areas of evaluation and the type of data that was most commonly collected for that particular area by percentage. For example, for the general area of motor function, 6 percent of the data gathered was of the descriptive level; 23 percent, nominal; 13 percent, nominal with protocol; 32 percent, ordinal; 15 percent, ordinal with protocol; and 11 percent, interval/ratio.

To determine the relationship between the level of data collected and the frequency with which a general area was evaluated by occupational therapy clinicians, a correlation analysis was computed. The correlation was computed between the number of evaluations that contained a particular area of assessment and the average level of data collected for that particular area. The average level of data collected for each individual area was computed by multiplying the amount of information collected at a particular level (Table 2) by a constant. Levels of data were assigned the following constants: descriptive = 1, nominal = 2, nominal/protocol = 3, ordinal = 4, ordinal/protocol = 5, interval/ratio = 6. For example, the average level of data collected for the motor area of assessment was equal to \(0.06 \times 1 + 0.23 \times 2 + 0.13 \times 3 + 0.32 \times 4 + 0.15 \times 5 + 0.11 \times 6 = 3.60\). A number between 1 and 6 was thus obtained for each area of assessment, with higher numbers representing higher average levels of data. The correlation was computed between the number of evaluations actually included in each area and the average level for that particular area and revealed an \(r = 0.63\) (\(t = 2.43, p < .05, df = 9\), one-tailed), indicating that those areas most frequently evaluated by occupational therapy clinicians were correlated with the higher levels of data, and conversely, that the lower or least reliable levels of measurement or data were used more often in those areas of function least frequently evaluated.

**Discussion and Conclusion**

One finding not presented in the *Results* section was the infrequent use of standardized tests and measurements. Even in areas such as hand function evaluation, where many standardized tests exist, there was little evidence of their use. Sixty-three percent of all the CVA evaluation forms returned indicated the use of some type of hand evaluation procedures. The majority of the hand evaluation forms provided space to record grasp and pinch strength but less than 5 percent of these forms provide a place to record standard scores. Another finding was the adapted use of portions of standardized tests. This was particularly common in the area of visual perceptual function where portions of visual perceptual tests standardized for children were used with the CVA population. Standardized tests of adult visual spatial functions are available for clinical use (8) but none of the evaluation forms indicated they were being employed.

It was also of interest that only 60 percent of those who contributed evaluation forms identified ADL status on the forms, although, presumably, training in ADL is a component of the majority of occupational therapy treatment programs for CVA patients. It should be noted that the possibility exists that some centers used separate ADL evaluation forms that did not routinely use as part of their CVA evaluation proce-

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**Table 1**

| Areas of CVA Evaluation Broken Down into Percent of Sub Area Evaluations |
|---------------------------------|-----------------|
| **Motor** (N = 34)              | **Sensory** (N = 29) |
| 1. Muscle tone                  | 1. Light touch   |
| 2. Limb synergies               | 2. Stereognosis  |
| 4. Range of motion              | 4. Temperature   |
| 5. Manual muscle test           | 5. Two-point discrimination |
|                                 | 6. Proprioception |

**Hand Function** (N = 22)  
1. Grasp strength  
2. Pinch strength  
3. Dexterity  
4. Gross grasp patterns  
5. Fine prehension patterns  
6. Visual closure  
7. Kinesthesia  
8. Deep pressure  
9. Vibration  
**ADL** (N = 21)  
1. Dressing upper extremities  
2. Dressing lower extremities  
3. Feeding  
4. Hygiene  
5. Homemaking  
6. Cooking  
7. Child care

* *A number of measures of visual perception required motor responses and were, therefore, not pure measures of visual perceptual ability.*
Table 2
Percent of Data Collected for Each Area of Evaluation
According to Levels of Measurement

<table>
<thead>
<tr>
<th>Area of Evaluation</th>
<th>Level of Data</th>
<th>1 (%)</th>
<th>2 (%)</th>
<th>3 (%)</th>
<th>4 (%)</th>
<th>5 (%)</th>
<th>6 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>Des</td>
<td>6</td>
<td>23</td>
<td>13</td>
<td>32</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Sensory</td>
<td>Nom</td>
<td>29</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>38</td>
<td>26</td>
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<tr>
<td>Hand Function</td>
<td>Nom/P</td>
<td>22</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>60</td>
<td>13</td>
</tr>
<tr>
<td>ADL</td>
<td>Ord/P</td>
<td>21</td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>49</td>
<td>17</td>
</tr>
<tr>
<td>Visual Perception</td>
<td>Int/Ratio</td>
<td>17</td>
<td>65</td>
<td>4</td>
<td>9</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Cognitive</td>
<td></td>
<td>16</td>
<td>71</td>
<td>11</td>
<td>5</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Apraxia</td>
<td></td>
<td>15</td>
<td>19</td>
<td>24</td>
<td>19</td>
<td>21</td>
<td>8</td>
</tr>
<tr>
<td>Behavior</td>
<td></td>
<td>11</td>
<td>77</td>
<td>12</td>
<td>8</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Oculomotor</td>
<td></td>
<td>10</td>
<td>43</td>
<td>7</td>
<td>3</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>Language</td>
<td></td>
<td>9</td>
<td>39</td>
<td>20</td>
<td>12</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Sensory</td>
<td></td>
<td>8</td>
<td>14</td>
<td>27</td>
<td>18</td>
<td>31</td>
<td>7</td>
</tr>
<tr>
<td>Integrative</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

The information provided in Table 2 reveals that, for the forms collected, the most frequently gathered level of data for occupational therapy evaluation of CVA is descriptive. This is the least reliable and most subjective or lowest level of data (7). One encouraging finding was that the more frequently a particular area is evaluated, the higher the level of data collected. In general, the highest or least subjective level of data was associated with areas most commonly evaluated and the lowest or more subjective level of data with areas least frequently evaluated.

It appears from the information gathered that therapists are not using standardized measures, even when they are available, to record the evaluative information they are obtaining from their CVA patients. The quality of information gathered at the beginning of therapy will directly affect the measurable outcome of treatment. The collecting of descriptive or other subjective evaluative information precludes the possibility of treatment outcomes being recorded and defined by objective quantifiable methods. Therapists using a subjective level of evaluative information cannot validly document treatment successes in measurable terms. Quantitative assessment is becoming increasingly recognized as the most legitimate indicator of therapeutic effectiveness.

While no one evaluation instrument can be applicable to all CVA patients, this investigation has revealed that there is a high degree of consistency in several areas of occupational therapy evaluation. Those areas of commonality (motor, sensory, hand function, visual perception, and ADL) provide a foundation for the further development of evaluative procedures unique to occupational therapy. The development of such procedures will require increased test sophistication on the part of clinical therapists together with the refinement and consistent use of evaluative procedures related to identified areas of occupational therapy assessment and treatment.

REFERENCES

1. Trombly CA, Scott AD: Occupational Therapy for Physical Dysfunction, Baltimore, MD: William and Wilkins, 1977