Letters to the Editor

Toward A Uniform Assessment of "Outcome"

To the Editor:

Spence and Donner\(^1\) have recently highlighted the need for merging medical and functional outcome parameters and for the development of a standard instrument which measures outcome in stroke survivors. These issues were addressed by the group involved with the demonstration project for the National Stroke Data Base in 1977, a project sponsored by the Office of Biometry and Field Studies of NINCDS.\(^2,3\) A standardized data vocabulary was subsequently constructed and used during the pilot phase of the Data Base Project.

Independently, other attempts to merge data from a large medical stroke data base with data from a comprehensive functional data base\(^4\) and a simple demographic data base yielded some information about outcome predictions.\(^5-11\) Nevertheless, these data did not greatly improve outcome prediction in a group of 841 patients when multivariate techniques were used to mathematically predict outcome using a "medical model."\(^11\) Other attempts to predict outcome using multivariate techniques, also based on medical data alone, have also failed.\(^12,13\) Experience suggests that psychosocial and socioeconomic variable must also be considered.\(^11,12\)

The Outcome Index proposed by Spence and Donner does not include this information.\(^1\) It also fails to adequately describe and/or delineate the differences between behavioral status, communication status, cognitive status, perceptual status, ability to walk, upper extremity function, self-care status, transfer status, homemaking abilities, ability to perform in real life situations, vocational/educational status, quality of life, living arrangements, amount of help needed to maintain the stroke patient, and the cost for care. By "lumping" all of these descriptors together, Spence and Donner decrease the sensitivity of their instrument while making it less useful to the clinician who cares for the patient and for the researcher who is attempting to see if various types of therapeutic intervention can change outcome in any of the categories listed. The Barthel's Index\(^14\) has the same shortcomings.

An alternative outcome assessment appears in the table. It is comprehensive, yet simple. It describes the whole spectrum of functional abilities, includes pertinent performance, psychosocial and socioeconomic variables, measures cost and attempts to measure some aspects of quality of life. It clearly indicates the intensity of services needed to maintain the individual and it may, therefore, be useful in assigning patients to appropriate levels of care. It can be used in a time-oriented fashion.\(^2,3\)

### Table

<table>
<thead>
<tr>
<th></th>
<th>I. Behavioral status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(0) No deficits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Mild deficits (occasionally demonstrates behavioral abnormalities or depression but does not require supervision because of these behavioral abnormalities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Moderate deficits (often demonstrates behavioral abnormalities or depression, requires supervision most — but not all — of the time; can be left alone but only for short periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Severe deficits (demonstrates behavioral abnormalities or depression most of the time; requires full time supervision; cannot safely be left alone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) Unmanageable (needs institutional care)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>II. Communication status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0) No deficits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Mild deficits (able to communicate most of the time; does not require supervision because of communication deficits)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Moderate deficits (able to communicate adequately only some of the time; needs supervision most of the time although can be left alone for short periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Severe deficits (unable to communicate effectively; requires full-time supervision; cannot be left alone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) Unmanageable (needs institutional care)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>III. Cognitive status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0) No deficits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(00) Unable to test because of communication problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Mild deficits (occasionally confused; requires some assistance or supervision; can be left alone for long periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Moderate deficits (often confused; requires frequent assistance or supervision; can be left alone only for short periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3) Severe deficits (confused most of the time; requires full-time assistance or supervision; cannot be left alone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4) Unmanageable (needs institutional care)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>IV. Perceptual status</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0) No deficits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(00) Unable to test because of communication problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1) Mild deficits (occasionally demonstrates perceptual abnormalities; requires some assistance or supervision; can be left alone for long periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2) Moderate deficits (often demonstrates perceptual abnormalities; requires frequent assistance or supervision; can be left alone only for short periods)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Downloaded from http://stroke.ahajournals.org by guest on October 1, 2017
(3) Severe deficits (demonstrates perceptual abnormalities most of the time; requires full-time assistance or supervision; cannot be left alone)
(4) Unmanageable (needs institutional care)

V. Ambulation
(0) No deficits
(1) Walks with or without assistive devices
   (11) long distances (more than 300 feet)
   (12) moderately long distances (50–300 feet)
   (13) short distances (5–50 feet)
   (14) very short distances (less than 5 feet)
(2) Unable to walk without physical assistance
(3) Unable to walk

VI. Upper extremity function
   Right upper extremity
   (0) No deficits
   (1) Functional (RUE is independently used to perform activities and can perform activities as well even in the presence of mild weakness, tremor, or dysmetria)
   (2) Functional assist (RUE cannot independently perform activities but can assist LUE)
   (3) Gross assist stabilizer (RUE can be used to stabilize objects or to assist LUE but lack of fine movement, tremor or dysmetria prevents more functional use)
   (4) Nonfunctional

   Left upper extremity
   (1) Functional (LUE is independently used to perform activities and can perform functional activities well even in the presence of mild weakness, tremor, or dysmetria)
   (2) Functional assist (LUE cannot independently perform activities but can assist RUE)
   (3) Gross assist/stabilizer (LUE can be used to stabilize objects or to assist RUE but lack of fine movement, tremor or dysmetria prevents more functional use)
   (4) Nonfunctional

VII. Self-care activities
(0) Independent
(1) Needs supervision but no assistance
(2) Needs assistance for dressing/feeding/hygiene (D/F/H)
(3) Needs assistance for bowel/bladder care (B/B)
(4) Needs assistance for D/F/H/B/B

VIII. Transfers
(0) Independent
(1) Mild deficits (needs observation, verbal cueing or supervision but no physical help)
(2) Moderate deficits (needs minimum to moderate physical help)
(3) Severe deficits (needs maximum assistance)
(4) Unable

IX. Homemaking
(0) Independent
(1) Mild deficits (needs observation, verbal cueing or supervision to cook, clean, do laundry, etc.)
(2) Moderate deficits (needs minimum to moderate physical help with or without adaptive equipment)
(3) Severe deficits (needs maximum physical help with or without adaptive equipment)
(4) Unable

X. Performance — real life situations
(0) Independent
(1) Mild deficits (needs observation, verbal cueing or drive supervision to use public transportation, drive, shop, go to a restaurant/theater, handle money, etc.)
(2) Moderate deficits (needs physical assistance to use public transportation, drive, shop, go to a restaurant/theater, handle money, etc.)
(3) Unable/won't try/gives up

XI. Work/school
(0) Working
  (01) Same job
  (02) New job
(00) In school
  (001) Same vocational goals
  (002) New vocational goals
(1) Retired
(2) Unemployed
(3) Disabled
  (31) Temporarily
  (32) Permanently

XII. Living arrangements
(0) Home (back to original home or with friends/family)
(1) Residential care facility (or equivalent)
(2) Extended care facility (or equivalent)
(3) Skilled nursing facility
(4) Chronic care hospital

XIII. Quality of life after stroke
(When rating, use the following criteria: activity patterns — work/school/home, leisure activities, position in home, personality pattern, sex patterns, types of close personal relationships, degree of life satisfaction, degree of socialization)
(0) Unchanged
(00) Enhanced
(1) Mildly diminished
(2) Moderately diminished
(3) Severely diminished
(4) No reason to continue living

XIV. Amount of help needed to maintain patient

<table>
<thead>
<tr>
<th>Code</th>
<th>Amount of help needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>less than 1 hour/week</td>
</tr>
<tr>
<td>2</td>
<td>less than 5 hours/week</td>
</tr>
<tr>
<td>3</td>
<td>5–10 hours/week</td>
</tr>
<tr>
<td>4</td>
<td>10–20 hours/week</td>
</tr>
<tr>
<td>5</td>
<td>20–40 hours/week</td>
</tr>
<tr>
<td>6</td>
<td>5 days/week (nights and days)</td>
</tr>
<tr>
<td>7</td>
<td>7 days/week (nights and days)</td>
</tr>
</tbody>
</table>

Code: Provider
(0) No help needed
(1) Family member of friend
(2) Companion
(3) Homemaker
(4) LPN
(5) Licensed skilled professional
  (41) RN
  (42) Physical therapist
  (43) Occupational therapist
  (44) Speech pathologist
  (45) Psychologist

Example: 2-6, 42-2, 44-1 would indicate a 5 day/week companion, PT less than 5 hours/week, speech less than 1 hour/week.

*Provider/Amount of help needed

*Total: ___________________
XV. Cost

(1) Bill for initial hospitalization
(11) Amount for PT/OT/Speech therapy
(12) #Hours PT/OT/Speech therapy
(2) Bill for subsequent hospitalizations
(21) Amount for subsequent PT/OT/Speech therapy
(22) Hours subsequent PT/OT/Speech therapy
(3) Bill for followup outpatient medical services
(31) Medical visits
(4) Amount for followup outpatient PT/OT/Speech therapy
(5) Total cost for medical services
(6) Total cost for rehabilitation services
(61) Total number of treatment hours

and can provide simple data for cost-effectiveness and cost-benefit analysis. The information need not be collected by a physician. Each section can be enlarged for specific research projects and the entire protocol can be easily merged with a demographic data base which describes pertinent population characteristics and with a medical data base which describes specific neurologic findings, neurodiagnostic tests and neurologic diagnoses. This instrument can also be used to describe functional abilities for patients with other chronic neurological disorders.

The Index presented in the table is being offered to stimulate interest in, and discussion of, setting standards for a uniform functional outcome assessment protocol. It "lumps" and "splits" differently than any other protocol that I know of. Because it relates specific disabilities to the amount of physical assistance needed to maintain the individual, while tracking costs, it may lead to a more scientific method of assigning patients to a level of care which is most appropriate to their needs while providing a uniform method of outcome assessment.

Joel S. Feigenson, M.D.
South Salem, New York 10590

References

9. Feigenson JS, Gitlow HS, Greenberg SD: Disability Oriented Rehabilitation Unit — A Major Factor Predicting Stroke Outcome. Stroke 10: 5-8, 1979

Editor's Note: The above communication was sent to the author of the paper discussed, and his comments follow.

To the Editor:

Dr. Feigenson has misconstrued the intent of our table, in which we presented "examples, from the literature, of elements that might be included in functional outcome scores." The purpose of the table was to show the difference between initial severity scores, and outcome scores, and to emphasize that it is desirable to use some form of outcome score to assess the success of therapy. We made no attempt to present a comprehensive outcome index such as that which is presented by Dr. Feigenson. I agree entirely that the outcome index he suggests would be an appropriate model for scoring outcomes, and I would hope that our paper would stimulate people to use such outcome scores in assessing the efficacy of treatment of patients with acute cerebral insults such as infarction.

J. David Spence, M.D., F.R.C.P.(C)
Departments of Medicine, Clinical Neurological Services and Pharmacology, Victoria Hospital
London, Ontario, Canada N6A 4E5
ERRATUM

July-August 1982 STROKE, Volume 13, Number 4, "Letter-to-the-Editor," Study Design of Stroke Treatment .......................................................... 527

John W. Norris and Vladimir C. Hachinski

This letter to the Editor was incorrectly credited to only Dr. John W. Norris. The signature should have read:

John W. Norris, M.D.
University of Toronto
Toronto, Ontario.

Vladimir C. Hachinski, M.D.
University of Western Ontario
London, Ontario.
Toward a uniform assessment of "outcome".

J S Feigenson

Stroke. 1982;13:873-876
doi: 10.1161/01.STR.13.6.873

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/13/6/873.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Stroke can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Stroke is online at:
http://stroke.ahajournals.org//subscriptions/