

In endeavoring to evaluate disability in relation to programs for rehabilitation, this paper discusses the problem of establishing objective means for this purpose.

REHABILITATION EVALUATION—SOME SOCIAL AND CLINICAL PROBLEMS

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Why a Public Health Problem?

THE PURPOSE of this paper is to present one of many methods of evaluating disability, and to discuss one important use of disability evaluation as well as some of the problems encountered in applying the method. The method, its use and the problems have some general significance for medical care and public health. This work has arisen as part of a change in the meaning of disability evaluation. The latter gained its modern social meaning with the advent of our first social insurance system, workmen's compensation. Although there have been many pressures to change the basic approach of workmen's compensation from cash benefits to rehabilitation as a prime purpose, the years since 1913 have seen only small steps in this direction. For the most part, disability is still thought of, classified, and acted upon as a defect with a cash value.

However, rehabilitation and medical care¹ workers have been concerned with measuring disability in terms of function in all the activities of normal living with an emphasis on the potential for rehabilitation. This report is concerned with the use of a method of disability evaluation to help determine when and to what extent rehabilitation services may

be applicable to a particular set of community needs, growing out of the high prevalence of disability among the aged.

The organization, coordination, and support of community health resources is the concern of public health. Certainly, in educating and fighting for sizable new expenditures in time, money, and personnel for new rehabilitation services, there ought to be substantial and objective evidence of the degree to which these services are effective, and for which groups. Such evidence is limited at present. A sound social decision for the best use of community resources must rest upon such knowledge.

Purpose of Disability Evaluation

What kinds of evidence can be developed? The first job is to try some simple tools to measure the success or failure of rehabilitation services prescribed for a particular group of patients and to determine whether these services were really needed. Accumulated community pressures—particularly from professional sources—in New York City dictated that such a test be conducted around aged persons in nursing homes. For this population, claims have been made from nearby and distant communities that rehabilitative services

make life more livable, return many patients "to the community," and bring about real savings, at least in immediate and visible costs, to the taxpayer.* It seemed worth while to see whether rehabilitation services were truly applicable and effective for this selected group of older persons. This is a group with a high mortality and low motivation, and no certainty about homes to which to return.

Actually, the first form of the question posed in this project was: What is the rehabilitation potential of this aged nursing home population? As discussed below, this seemed part of the same question. Of equal importance was the belief that the methods and tools developed could be applied to other areas of medical care evaluation. We believe that all medical care services will ultimately be judged qualitatively in relation to their success or failure in maintaining or restoring a state of well-being appropriate to the potentialities of the individual or group.

In order to define success or failure, some simple and replicable measures of disability were required. The set of indexes developed relate to defects in selected, hopefully representative, components of self-care activities.† The group of five items chosen is only a small piece of a total profile of patient status. Nevertheless, these indexes were chosen as most relevant to the questions posed for us and sufficiently well known to be considered as probably reliable over time. Further, this segment of

any larger profile of disability demonstrates some of the problems faced in achieving check marks which are clinically meaningful, valid, and replicable on that ubiquitous representative of the machine—the IBM card.

This functional evaluation covers: (1) ability to get from one place to another—locomotion is the generic term, and it includes the use of a wheelchair; (2) ability to get from one state or position to another state or position, as from bed to wheelchair, from bed to standing position, from wheelchair to another chair—known as transfer; (3) ability to feed oneself; (4) ability to toilet oneself; and (5) ability to dress oneself. Many other factors are examined for and will be reported descriptively at the conclusion of the study. However, the objective test of success or failure, of the applicability and effectiveness of rehabilitation services to the group as a whole, will rest on the disability evaluation.

What about rehabilitation potential? The New York State Health Department has recently reported a study of rehabilitation potential for patients in nursing homes in New York State based on the clinical judgment of individual clinicians in physical medicine.² This approach is widely accepted as probably valid for identification of the small group of nursing home residents who will respond quickly and well. However, it appears that clinical prediction has not yet been compared with actual outcome in a controlled series—particularly as it relates to those patients whose potential would ordinarily be rated as very slight or zero, or for the group of patients whose current needs are borderline. It was, therefore, decided to attempt determination of rehabilitation potential, retrospectively, by trying rehabilitation services for everyone found to have any degree of functional disability on psychiatric screening. Patients in a terminal state, with limited

* (a) Social work report at the 1958 APHA session of the Medical Care Section on Social Work Research in Medical Care from Essex County, N. J., claimed significant tax savings with rehabilitation.

(b) "... restorative services to patients have frequently accomplished almost unbelievable results..." says Dr. G. M. Shinnors of Wisconsin about rehabilitation services under health department auspices in nursing homes in the *Chronic Illness Newsletter* 10,4:3 (Aug.), 1959.

† A copy of the self-care evaluation form may be obtained from the author.

life expectancy, or whose condition did not permit any rehabilitation services at all, were ruled ineligible. And, by the definition suggested above, we also ruled out nursing home residents showing no functional disability on the original psychiatric screening.

Project Description

All those remaining, that is, all those with some degree of functional disability, were distributed by major diagnostic categories and subsequent random selection into two rehabilitation treatment populations and two control populations. Using the disability evaluation tool for objective review and descriptive analysis as well, we hope to help define rehabilitation potential by finding out which treated groups of patients benefit from the rehabilitation program. Benefit will be defined as performing better, relative to the untreated controls, in the periodic test evaluations of disability. It will also be possible to compare the prognoses, or statements of rehabilitation potential, offered by the screening psychiatrists and by the clinical treatment teams with the treatment results in this somewhat unusual group of patients. (It is unusual because a large

proportion would not ordinarily be referred for rehabilitation services.)

The opportunity also exists to study the correlation between the outcome of treatment and pretreatment characteristics not only in regard to functional status, but also in areas of selected demographic and social variables, psychological evaluation, medical history, and findings. Data collection in all of these areas is well under way and reports will be made as the studies are completed.

Most of the medically indigent patient population of proprietary nursing homes in Manhattan—some 2,000 patients in 15 homes—were screened by the psychiatrists to bring into the study 400 patients eligible under the criteria already mentioned. Those accepted are turning out to be largely patients with musculoskeletal or neuromuscular disorders (Table 1). They are elderly with the modal age between 70 and 79 (Table 2-B) and show a predominance of women (43 per cent are men. Table 2-A).

Four hundred patients have been matched according to diagnosis and divided among four groups, A, B, C, and D. One control population, group D, resides in nursing homes where no

Table 1—Number of Patients by Assigned Group According to Diagnostic Category

Diagnostic Category	Assigned Group				Total	
	A	B	C	D	Number	Per cent*
1. Hemiplegia and paraplegia	35	35	35	35	140	34
2. Lower extremity fracture	18	17	18	12	65	16
3. Arthritis	15	15	14	14	58	14
4. Amputation	15	14	14	12	55	13
5. Other neurological	8	8	8	8	32	8
6. Cardiac	4	4	4	2	14	3
7. Other	11	11	10	11	43	11
Total	106	104	103	94	407	100

* All percentages are approximate.

Table 2—Number of Patients by Assigned Group According to Sex and Age Level

A. Sex	Assigned Group				Total	
	A	B	C	D	Number	Per cent
Male	41	43	45	44	173	43
Female	65	61	58	50	234	57
Total	106	104	103	94	407	100

B. Age Level	Assigned Group				Total	
	A	B	C	D	Number	Per cent
Under 49	4	4	2	3	13	3
50-59	12	8	10	11	41	10
60-69	24	17	30	25	96	24
70-79	37	45	31	34	147	36
80-89	24	25	28	18	95	23
90-99	5	4	2	3	14	3
100+	0	1	0	0	1	1
Total	106	104	103	94	407	100

treatment program of ours is in effect. We have added this control group in view of a possible "halo effect"* since the other control population, group A, lives in homes in which treated patients also live. This control group A will receive whatever services are normally available in their nursing homes or through the routine channels of the public assistance medical care program.

There are two treatment populations, groups B and C, since there is an interest in seeing whether similar results could be obtained through treatment in hospital rehabilitation centers and through treatment by mobile teams in the nursing homes. Some clinical judgments about this will be offered later in the study.

Coincident with the assignment to one of the study groups, patients have been subjected to a pretreatment disability evaluation by a team having no knowledge of the study group assign-

ment. This assessment of self-care is carried out by a rehabilitation team of the Department of Rehabilitation Medicine at the Albert Einstein College of Medicine. Each patient has been given five objective scores in the categories detailed above: (1) locomotion, (2) transfer, (3) feeding, (4) dressing, and (5) toileting. This evaluation will be repeated one year after treatment contact has been established with the patient. The same evaluation at the same interval will be applied to the control populations. The self-care evaluation team receives no notice of the patient's status in the study. Our treatment teams receive no notice of the scores given by the evaluation team. The dynamics of patient movement dictate that the evaluation team functions almost the year round, as patients have entered the study and are now reaching their anniversary dates. This assures reasonable continuity of understanding, techniques, judgments—at least some of the many subjective factors, which enter into objective scores.

* The presence of patients under our special rehabilitation program may have some direct and indirect effects on control patients living with them. This is a "halo effect."

Problems in Applying the Disability Evaluation Test

Achieving these five indexes of disability in self-care, in the pretreatment phase alone, involved over 70 round trips across New York City by ambulance, staffed with a driver, a nurse, and often some other staff member. It has required meal arrangements outside the nursing home, at the Einstein Medical College, for the 400 patients. Cooperation and some level of participation has been received from New York's Departments of Hospitals and Welfare, from 15 proprietary nursing homes, their operators and staff, from our own staff, from the patients' physicians, from their families, and certainly from the patients themselves. To many of the latter, it has been an exciting expedition, grossly changing the circumstances of their lives—at least for the day—and thereby grossly changing the nature and degree of their responses. Comparison of the results of the preliminary psychiatric screening in the nursing home with the test findings at Einstein in individual instances and for the group as a whole has raised sharply a general question about the validity of comparisons between disability evaluations carried out in different social settings.

The psychiatrists screened nursing home residents to select all patients showing any degree of functional impairment. Yet, a few miles and a few hours away, close to half the selected population achieved high scores in the five self-care evaluation tests performed at the Einstein Medical College. One can identify individual patients who appeared incapable, on screening examination and review of nursing home records, of any self-care activity, but who exhibited fairly good responses in all the self-care activities when tested by the evaluation team.

In addition to variations in test results related to changes in the social

setting, there must be other problems which may have contributed to the discrepancy between the clinical evaluation of disability by the psychiatrists and the five objective test scores. Perhaps the testing procedures performed by the evaluation team were not valid. A detailed review of the steps of testing was carried out. It was the interpretation of some of the reviewers that the rehabilitation team performing the evaluations brought to the test the attitudes and goals normally expected of a clinically oriented procedure in rehabilitation. The test appeared to be regarded as a challenge to the worker's rehabilitation purposes and almost as a part of a rehabilitation process. It was, therefore, appropriate to exert every effort to bring out the best possible performance by the patient—and to grade him so as to give maximum encouragement with an indication of anticipated optimum prognosis or potential. For example, a patient, with coaxing, might get his jacket most of the way on. He then might be graded as accomplishing an act of dressing.

Certainly, the clinician needs to view patients both in terms of current performance and of potential as he derives a diagnosis of disability status and develops his treatment program. But the researcher must sharply separate the measurement of current performance from the prognosis for performance if he is to have a reliable testing instrument for the current state of disability.

With the help of the evaluation team, a carefully defined set of activities of daily living testing procedures was prepared, including an orientation to research testing, a set of general instructions and the commands, directions, or demonstrations which may be given the patient for each of the five activities under observation. These instructions, in outline form, take ten typed pages.* Re-

* A copy of the general instructions and commands can be obtained from the author.

view of this material with the evaluation teams by its own chiefs offers promise of reasonable standardization from patient to patient, from observer to observer, and over time. (The word "reasonable" is used in recognition of the difficulty in standardizing all criteria for such testing at present.)

However, even with the elimination of coaxing and aiding of patients, a high proportion of the patients tested continue to show relatively high scores, suggesting a low level of manifest impairment in self-care. (The actual proportions will not be available until later in the study.) Perhaps this type of disability evaluation is too coarse for some purposes. In company with other functional tests, it fails to take the social setting or the purpose of function into account. It clearly differs from the screening clinical evaluations. Does this test give adequate information on the ability of patients to sustain activity over meaningful periods of time? This question has yet to be answered for this and other functional evaluations as well.

Some further indication will be achieved later of whether an evaluation such as ours, compared, for example, with the prognostications of the screening physiatrists, can discriminate to the extent of picking out from all patients with some degree of functional impairment those who actually need service. This question of ability to identify those needing service—those with a rehabilitation potential—brings us back to the possible usefulness of this type of disability evaluation, focused on specific functions which are the objectives of the therapy program.

Conclusions

The problems of costs of testing in time, effort, people, and money, and of replicability and validity revealed by our efforts with just this one set of

tests in a single functional area, self-care, suggest the urgency for development of indexes for the vast array of functions for which disability evaluations claim to measure. We are attempting such developments in the general medical and in the psychiatric area,* in regard to the psychological functions thought to correlate with outcome and in relation to the social status of patients. Out of such studies will come the clinical and statistical basis for establishing the much needed shorthand for defining and prognosticating about a patient's potential capacity and for rapidly identifying the rehabilitation needs of groups of people.

Despite the problems exhibited by this disability evaluation, and implied about others, the strong conviction remains that reliable tests of ability to function in defined situations are appropriate measures of both patient status and of the values of rehabilitation. Such measures certainly are more meaningful in identifying rehabilitation needs than earlier mechanical descriptions of disability. In an aged group of patients, this self-care functional disability evaluation, repeated at intervals, will reveal which patients have benefited from therapy and to what extent, since self-care activities represent the major objectives for most of them. Correlations of outcome with characteristics on admission should help to define rehabilitation potential. And lastly, it is expected that some such evaluations providing a profile of the results of treatment will offer a method of judging the quality of the services provided, by rehabilitation or any other health service which seeks to restore, maintain, or improve man's ability to function.

* An Approach to Disability Evaluation. L. I. Kaplan; J. S. Tobis; and M. Lowenthal. Presented at the 1959 meeting of the American Congress of Physical Medicine and Rehabilitation, Minneapolis, Minn.

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Citizens of the World

“In our culture, from Newton to Einstein, science has always been an international enterprise. The giants upon whose shoulders the giant Newton stood were a German, Kepler; a Pole, Copernicus; and an Italian, Galileo. So our modern understanding of the nature of matter is the collaborative triumph of the French, Lavoisier, Pierre and Marie Curie, and de Broglie; the British, Dalton, Thomson, and Rutherford; the Russian, Mendeleyev; the Italian, Enrico Fermi; the Dane, Niels Bohr; the Germans, Einstein, Planck, and Heisenberg; the Americans, Gibbs, Michelson, and Millikan. This is why men of different nations, so often in the history of science, have made the same discovery simultaneously. Such coincidence is almost inevitable in the case of great discoveries. Within the same half-decade, Newton and Leibniz fashioned the powerful instrument of the calculus. Joseph Henry, an obscure schoolteacher in Troy, New York, anticipated almost every one of the basic experiments that won Michael Faraday his fame as the founder of electrical technology.”

(Gerard Piel. Bulletin of the Atomic Scientists, September, 1955, p. 239.)

