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BRIEF REPORT

# Rehabilitation Professionals Still Do Not Communicate Effectively About Cognition

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**Abstract**

**Objective:** To examine current use of descriptive labels for levels of cognitive impairment and types of memory to explore whether rehabilitation disciplines are now communicating more effectively.

**Design:** Survey of rehabilitation professionals.

**Setting:** Hospital rehabilitation programs.

**Participants:** Respondents (N=130) representing 8 facilities in 5 states completed surveys.

**Interventions:** Not applicable.

**Main Outcome Measures:** Responses to survey questions about severity and types of memory impairment were examined with the Kruskal-Wallis test to determine the impact of profession on ratings. Post hoc Mann-Whitney *U* test comparisons of the 2 professions with the most cognitive assessment experience, psychologists/neuropsychologists and speech-language pathologists, were conducted.

**Results:** Ratings of various deficit levels differed significantly by profession (mild: $H=39.780$, $P<.000$; moderate: $H=43.309$, $P<.000$; severe: $H=38.354$, $P<.000$), but not by program location. In comparing psychologists/neuropsychologists and speech-language pathologists specifically, we found a significant discrepancy in ratings for percentile ranges associated with the terms mild ($U=103.000$, $P<.001$), moderate ($U=78.000$, $P<.000$), and severe ($U=109.000$, $P<.001$). Disagreement on the meaning of descriptive memory terms was noted among rehabilitation professionals in general, with large percentages of respondents not agreeing on the meanings of terms.

**Conclusions:** A significant lack of consensus persists regarding the understanding of common cognitive terminology. This miscommunication affects cognitive impairment descriptors (eg, mild, moderate, severe) and categorization of types of memory. Only half of rehabilitation professionals appear aware of this discrepancy, suggesting that education is necessary to bring greater awareness of the potential for miscommunication.

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Medical rehabilitation involves a multidisciplinary team that must collaborate effectively to best treat patients. Accrediting bodies, such as the Joint Commission (an independent organization that accredits and certifies health care organizations and programs in the United States), require evidence of interdisciplinary collaboration in hospital programs.[1] As such, effective communication among members of the rehabilitation treatment team is essential for successful coordination of care in multidisciplinary rehabilitation settings. For example, picture a neuropsychologist reporting in a team meeting that a survivor of a left cerebrovascular accident is exhibiting a mild deficit in long-term verbal memory. The neuropsychologist assumes that the patient has accurately conveyed information that can be used in treatment and discharge planning. The physiatrist and other team members nod, thinking they have understood what kind of memory is impaired and what the level of impairment is. In reality, members of the treatment team may leave the meeting with quite different understandings about the case.

A 1992 study by Wanlass et al[2] that examined communication among rehabilitation disciplines found a significant lack of consensus in the use of common terminology (deficit labels and terms used to describe different types of memory) within and across disciplines. More recently, Guilmette et al[3] found that rehabilitation staff members have difficulty understanding

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cognition and the different domains that it comprises. Guilmette et al[4] documented neuropsychologists' inconsistent use of terminology to describe test performance and pointed out how this can leave consumers, referral sources, and other clinicians confused about the meaning of test results and can also impact outcomes in criminal and civil cases. Other researchers have provided evidence that poor communication can cause significant health care errors, patient harm, and other deleterious effects in various health care settings.[5-7]

In the intervening years since the initial Wanlass study, interdisciplinary collaboration has occurred in an effort to improve some aspects of rehabilitation team communication (eg, an agreement to begin using the term acquired brain injury rather than head injury).[8] More specifically, guidelines have been created to encourage neuropsychologists and speech-language pathologists to better collaborate through coordination of evaluations, develop awareness of guidelines for test usage, and attempt to use the same functional perspective to work with cases.[9] To date, however, no consensus has been reached within or across rehabilitation disciplines on use of descriptive labels for degree of cognitive deficit or type of memory impairment.

Because imprecise communication about cognition can lead to misunderstandings among rehabilitation professionals and negatively impact patient care, we conducted this follow-up investigation to the 1992 Wanlass study.[10-12] This follow-up survey of rehabilitation professionals examined the use of descriptive labels for cognitive impairment (mild, moderate, severe) and use of terms to characterize different types of memory (long term, short term, remote, recent, immediate, working memory) to explore whether there has been any improvement in the common understanding of such terminology since the initial study.

## Methods

A total of 130 respondents (58% return rate) representing 8 rehabilitation facilities in 5 states (California, Michigan, Illinois, South Carolina, Virginia) were surveyed about their use of descriptive labels for cognitive impairment (mild, moderate, severe) and use of terms to characterize different types of memory (long term, short term, remote, recent, immediate, working). Of the 130 respondents, 12 were physiatrists, 5 were rehabilitation nurses, 20 were occupational therapists, 34 were physical therapists, 20 were psychologists, 2 were social workers, 30 were speech-language pathologists, 2 were vocational counselors, and 2 were recreational therapists (3 respondents did not specify job type). The response rate and number of respondents were similar to the original study, which had 132 respondents, with a 62% return rate. To best replicate the original study, efforts were made to attempt to use the same facilities, but this was not possible in all cases, and responses from additional facilities were sought to improve generalizability of findings. Similar to the original study, all respondents were involved in the rehabilitation of cognitively impaired patients, with some working in acute rehabilitation settings and others providing postacute rehabilitation services.

Respondents were provided with the same survey that was used in the original study. The survey was composed of 12 questions; however, 2 of the questions required multiple responses. A copy of the survey can be found in appendix 1. Following the same method as the one used in the original study, the survey was provided in paper format to a contact person in each setting who then distributed it to colleagues. The survey was introduced with the following statement, the same statement used in the initial study:

This is a survey of how professionals in rehabilitation settings perceive the meaning of the labels "mild," "moderate," and "severe." For the purpose of this survey, please assume that these labels are being used to describe a patient's level of impairment in some aspect of cognition (eg, memory). You will be asked to state what these labels (ie, mild, moderate, severe) mean to you in terms of percentile ranges. As an example of what is meant here by "percentile ranges," in a group of 100 people, the 10 richest would fall in the 90th to 99th percentile range for wealth, and the 10 poorest would fall in the 0th to 9th percentile range for wealth.

Descriptive statistics were used to characterize responses on survey measures when appropriate. Kruskal-Wallis test comparisons using the 9 independent professional groups (physiatrists, rehabilitation nurses, occupational therapists, physical therapists, psychologists/neuropsychologists, social workers, speech-language pathologists, recreational therapists, vocational counselors) were used to study the impact of professional discipline on the dependent variables of ratings of severe, moderate, and mild deficits. Respondents were asked what percentile range a patient's score would fall within if he/she had mild, moderate, or severe memory impairment. Potential responses were provided in a forced choice format, with 7 percentile ranges to choose from for each impairment label. Mann-Whitney $U$ test comparisons of the 2 professions expected to have the most cognitive assessment experience, psychologists/neuropsychologists and speech-language pathologists, were also conducted.

## Results

Most (93.1%) respondents indicated that they make use of the labels mild, moderate, and severe to describe their patients' extent of impairment. Most respondents (98.5%) also indicated that their colleagues use these labels. Half of the respondents (50%) believe that there is a common understanding of the meaning of these labels.

### Ratings of deficit levels differed significantly by profession

Kruskal-Wallis test results demonstrated that ratings of the percentile ranges indicative of various deficit levels differed significantly by profession (mild: $H=39.780$, $P<.000$; moderate: $H=43.309$, $P<.000$; severe: $H=38.354$, $P<.000$), but not by location of the rehabilitation program. Table 1 shows the means and SDs of responses associated with each profession.

Post hoc comparisons of forced choice ratings between psychology/neuropsychology and speech-language pathology, the 2 disciplines most likely to conduct cognitive assessments, demonstrated a significant discrepancy in the understanding of the statistical categories underlying the terms mild ($U=103.000$, $P<.001$), moderate ($U=78.000$, $P<.000$), and severe ($U=109.000$, $P<.001$), with speech-language pathologists, on average, generally linking these terms to higher percentile ranges than psychologists/neuropsychologists (table 2).

### Same or different types of memory

Respondents were also questioned about their understanding of the meaning and equivalency of different memory terms. In particular, they were asked the following question: Is long-term memory the same thing as remote memory? Similar questions were posed for

**Table 1** Ratings of the percentile range associated with mild, moderate, and severe cognitive impairment by profession

| Profession | n | Mild Deficit* | Moderate Deficit† | Severe Deficit‡ |
|---|---|---|---|---|
| Physiatrist | 8 | 5.38±2.20 | 4.43±2.15 | 3.38±2.07 |
| Physical therapist | 23 | 5.87±2.14 | 5.19±1.57 | 4.45±2.19 |
| Psychologist | 19 | 1.47±1.50 | 1.26±0.93 | 1.16±0.69 |
| Occupational therapist | 13 | 5.23±2.77 | 4.92±1.61 | 3.85±1.77 |
| Rehabilitation nurse | 4 | 6.25±1.50 | 5.25±1.50 | 4.50±1.91 |
| Recreational therapist | 2 | 7.00±0.00 | 7.00±0.00 | 7±0.00 |
| Social worker | 2 | 6.00±1.41 | 5.00±2.83 | 2.50±2.12 |
| Speech-language pathologist | 24 | 3.54±2.34 | 3.26±2.00 | 2.67±2.04 |
| Total | 95 | 4.32±2.68 | 3.83±2.22 | 3.15±2.18 |

NOTE. Values are mean ± SD or as otherwise indicated.

* Definition of rating scores: for mild impairment, 1 (11th—17th percentile), 2 (18th—24th percentile), 3 (25th—31st percentile), 4 (32nd—38th percentile), 5 (39th—45th percentile), 6 (46th—52nd percentile), and 7 (53rd—60th percentile).

† Definition of rating scores: for moderate impairment, 1 (4th—10th percentile), 2 (11th—17th percentile), 3 (18th—24th percentile), 4 (25th—31st percentile), 5 (32nd—38th percentile), 6 (39th—45th percentile), and 7 (46th—52nd percentile).

‡ Definition of rating scores: for severe impairment, 1 (0th—3rd percentile), 2 (0th—10th percentile), 3 (0th—17th percentile), 4 (0th—24th percentile), 5 (0th—31st percentile), 6 (0th—38th percentile), and 7 (0th—45th percentile).

short-term memory and recent memory and for immediate memory and working memory. Significant disagreement among all rehabilitation professionals was found in the understanding of the meanings of these terms, as demonstrated in table 3. For example, immediate memory and working memory, which are generally regarded in neuroscience as 2 discrete constructs (one is a type of memory, and the other is a type of complex attention), were described as synonymous by 42% of respondents. Similarly, when respondents were asked to define memory by time intervals, considerable variability was noted. For example, respondents were asked the following: What type of memory (long term, immediate, recent, remote) are you assessing when you ask a patient to recall something you told him/her 1 week ago? Only about half of all respondents rated this as reflecting long-term memory. As figure 1 demonstrates, approximately 30% of respondents characterized a 1-week interval as reflecting recent memory, whereas 12% perceived it as remote memory.

## Discussion

Consistent with findings of the original study, a significant lack of consensus regarding the understanding of common cognition-related terminology (deficit labels and terms used to describe different types of memory) continues to exist. In comparison with the original study, there continues to be a wide discrepancy in the meanings (percentile ranges) assigned to the labels of mild, moderate, and severe between the various rehabilitation professions. Similarly, psychology/neuropsychology and speech-language pathology, the 2 disciplines most likely to use these terms, were significantly discrepant in their understanding of the statistical categories underlying the terms mild, moderate, and severe, with speech-language pathologists generally linking these terms to higher percentile ranges to the extent that speech-language pathologists' ratings of a moderate deficit would correspond with psychologists' ratings of normative functioning. This pattern is consistent with patterns seen in the previous study. The reason for the discrepancy between ratings of cognitive functioning between the 2 disciplines most likely to perform cognitive assessments is unclear, but it may reflect training differences in the 2 professions, with psychologists primarily focusing on assessment and secondarily focusing on treatment, whereas speech-language pathologists may have assessment as a secondary focus to treatment. Both speech-language pathologists and psychologists tended to overrate impairment in that their ratings for mild impairment ranged from the 18th percentile to the 38th percentile, whereas standardly accepted ratings for impairment would characterize mild impairment as falling at least 1 SD below the population mean, in other words, <16th percentile. Rehabilitation disciplines also continue to have different understandings about what is meant by terms for various types of memory.

### Study limitations

A limitation of this study is that although efforts were made to sample a wide variety of geographic regions across the United

**Table 2** Speech-language pathology versus psychology/neuropsychology mean percentile ranges associated with the descriptors mild, moderate, and severe

| Deficit Level | Speech-Language Pathologists | Psychologists/ Neuropsychologists |
|---|---|---|
| Mild | 32nd—38th | 18th—24th |
| Moderate | 18th—24th | 4th—10th |
| Severe | 0th—17th | 0th—3rd |

NOTE. All values are approximate percentiles.

**Table 3** Agreement on the meaning of memory terms among all rehabilitation staff

| Perception of Memory Terms | Yes | No |
|---|---|---|
| Is long-term memory the same as remote memory? | 31st | 66th |
| Is short-term memory the same as recent memory? | 50th | 47th |
| Is immediate memory the same as working memory? | 42nd | 53rd |

NOTE. All values are percentages of the sample.

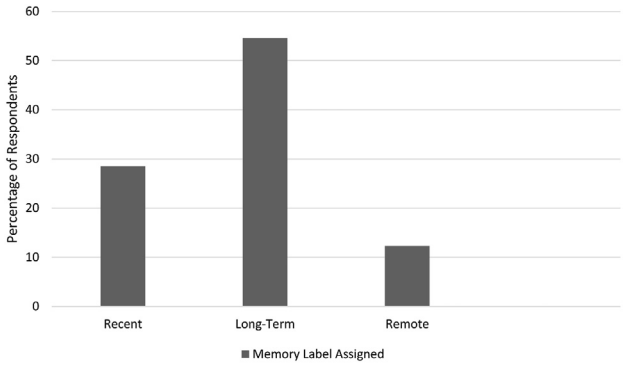


**Fig 1** What type of memory a 1-week interval reflects.

States, rehabilitation sites in only 5 states were surveyed, which could limit the full generalizability of these findings. However, the survey results did not find a discrepancy between survey sites in the severity ratings assigned, suggesting that these results may generally be considered representative of how the various rehabilitation professions rate impairment.

## Conclusions

Only half of the rehabilitation professionals appear aware of these communication discrepancies, suggesting that further education is necessary to bring greater recognition of the significant potential for miscommunication that can impact rehabilitation services. Once rehabilitation professionals are more aware of this problem, teams can be encouraged to develop agreed on glossaries for common cognition-related terminology and establish percentile ranges into which descriptive labels (eg, moderate) are anchored. For example, the authors of the original study created a physical medicine and rehabilitation glossary for use by their department that same year.[13] It provided definitions of various terms that might be common in one rehabilitation profession, but less well understood by other rehabilitation professions. It also included definitions of the various types of memory and a section on how to characterize the severity of cognitive impairment as demonstrated on standardized tests. Another helpful technique to clarify terminology is the use of a table embedded within clinical patient assessment reports that clearly states the definition of these terms and interpretations of the measures used. Periodic retraining of staff in regard to these issues will be necessary given staff turnover.

## Keywords

Cognition; Communication; Memory; Rehabilitation; Terminology as topic

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## Appendix 1 Rehabilitation Terminology Questionnaire

This is a survey of how professionals in rehabilitation settings perceive the meaning of the labels "**mild**," "**moderate**," and "**severe**." For the purpose of this survey, please assume that these labels are being used to describe a patient's level of impairment in some aspect of cognition (eg, memory). You will be asked to state what these labels (ie, mild, moderate, and severe) mean to you in terms of ***percentile ranges***. As an example of what is meant here by "percentile ranges," in a group of 100 people, the ten richest would fall in the 90 to 99 percentile range for wealth, and the 10 poorest would fall in the 0-9 percentile range for wealth.

1. How often do **you** use the labels "**mild**", "**moderate**", or "**severe**" to describe patients' level of impairment?
   _____ often _____ sometimes _____ never
2. How often do **your colleagues** use the labels "**mild**", "**moderate**", or "**severe**" to describe patients' level of impairment?
   _____ often _____ sometimes _____ never
3. Do you believe there is a common understanding of the meanings of these labels?
   _____ yes _____ no
4. Assume that a 25-year-old patient was given a memory test that had been standardized on a normal population. In what percentile range would the patient's score fall if he had a **mild** memory impairment?
   _____ *Please write in a **percentile range** (eg, 10 − 18%ile or 75 − 77%ile)*
5. Assume that a 25-year-old patient was given a memory test that had been standardized on a normal population. For each category of impairment, please mark with an "X" the **percentile range** below that would best reflect the patient's score if he had a:

| | | | | **CHOOSE 1 ONLY** | | | |
|---|---|---|---|---|---|---|---|
| **Mild Impairment** | _____ 11- 17%ile | _____ 18-24%ile | _____ 25-31%ile | _____ 32-38%ile | _____ 39-45%ile | _____ 46-52%ile | _____ 53-60%ile |
| **Moderate Impairment** | _____ 4-10%ile | _____ 11-17%ile | _____ 18-24%ile | _____ 25-31%ile | _____ 32-38%ile | _____ 39-45%ile | _____ 46-52%ile |
| **Severe Impairment** | _____ 0-3%ile | _____ 0-10%ile | _____ 0-17%ile | _____ 0-24%ile | _____ 0-31%ile | _____ 0-38%ile | _____ 0-45%ile |

**6**. In a group of 100 people, at what percentile on a scale of wealth would the person who was the 25th wealthiest fall? (Please give a **single number**, not a range.) _____

**7**. "How much memory impairment does the patient described below have?"

She is a high-school-educated 63-year-old with a closed head injury. She knows her name, birthdate, and age, and she can state the name of the current president but not his predecessor. She can recall only the first syllable of the name of the current governor. She is oriented to the year, month, and day and knows the city and name of the hospital she is in. She is able to recall only 5 out of 22 facts from a short story immediately after it is read to her. When asked about this same story one half hour later, she still remembers only 5 facts (the story was not read to her again). She can remember no more than 5 digits (eg, 8-2-7-3-4) immediately after they are read to her. When asked to recall a series of digits in reverse order from how they are read to her, she is only able to complete a series of 3. When you see her the next day, she seems to recognize you, but does not remember your name. **Is her memory:**

____ normal for her age ____ mildly impaired ____ moderately impaired ____ severely impaired

**8**. A 68-year-old stroke patient remembers 1 out of 3 objects after a 5-minute delay. **Is his memory:**

_____ normal for his age _____ mildly impaired _____ moderately impaired _____ severely impaired

**9**. Is long-term memory the same thing as remote memory? Y N

**10**. Is short-term memory the same thing as recent memory? Y N

**11**. Is immediate memory the same thing as working memory? Y N

**12**. What type of memory (eg, long-term, immediate, recent, remote) are you assessing when you ask a patient to recall something you told him:

**CHOOSE 1 ONLY**

| | Immediate | Recent | Long-term | Remote |
|---|---|---|---|---|
| one hour ago? | _____ | _____ | _____ | _____ |
| one week ago? | _____ | _____ | _____ | _____ |
| one month ago? | _____ | _____ | _____ | _____ |
| one second ago? | _____ | _____ | _____ | _____ |

**13**. What is your profession?

_____ Occupational Therapy _____ Physiatry _____ Physical Therapy _____ Psychology/Neuropsychology _____ Recreational Therapy

_____ Rehabilitation Nursing _____ Social Work _____ Speech/Language Pathology _____ Vocational Counseling _____ Other (specify)

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