

Outcome Oriented

The Online Newsletter of the
Center for Outcome Measurement in Brain Injury (COMBI)

Summer 2000

You've Got Scales!

The COMBI continues to add more important scales to its resource center. As of July 2000 there are currently sixteen measures featured and detailed in the COMBI.

Agitated Behavior Scale (ABS)

Coma/Near Coma Scale (CNC)

Community Integration Questionnaire (CIQ)

The Craig Handicap Assessment and Reporting Technique (CHART)

Disability Rating Scale (DRS)

The Family Needs Questionnaire (FNQ)

Functional Assessment Measure (FAM)

Functional Independence Measure (FIM)

Glasgow Outcome Scale (GOS)

Level of Cognitive Functioning Scale (LCFS)

Mayo Portland Adaptability Inventory (MPAI)

Neurobehavioral Functioning Inventory (NFI)

The Orientation Log (O-Log)

The Patient Competency Rating Scale (PCRS)

Satisfaction With Life Scale (SWLS)

Supervision Rating Scale (SRS)

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COMBI Update

Year Two Brings More Features and More Users

Introduction

The Center for Outcome Measurement in Brain Injury (COMBI) is an online resource center created for individuals looking for information on brain injury outcome and assessment scales. The COMBI is funded by the National Institute on Disability and Rehabilitation Research (NIDRR) and is a collaborative project of nine research centers (TBI Model System Projects) that specialize in brain injury. Information on the COMBI is available free of charge.

Currently, the COMBI contains information on 16 outcome or assessment scales. Materials available include scale syllabi, administration and scoring guidelines, training and testing materials, information on scale properties, references, scale forums, and frequently asked questions (FAQs). Rating forms for most of the measures are also available for downloading. COMBI users have the advantage of instant access to the materials they want.

New Features

In the last year, five scales have been added to the COMBI: Coma/Near Coma Scale (CNC), the Craig Handicap Assessment and Reporting Technique (CHART), the Family Needs Questionnaire (FNQ), the Orientation Log (O-Log), and the Satisfaction With Life Scale (SWLS). For more information on these scales, please see the article on Page 2.

We've recently (3-2-00) made a major overhaul of our bulletin board system. We now have forums available for each of the COMBI-featured scales. Each forum has a moderator, usually the same individual who was responsible for contributing the scale's other information. There is even email notification when your post is responded to! See for yourself at <www.tbims.org/combi/bb.html>

Background information and survey results from COMBI were published in an article in the February 2000 issue of the *Journal of Head Trauma Rehabilitation*.

Usage Statistics

In the last year (July 99–June 00) the COMBI has logged in 35,960 visitors. That's almost 100 users a day! During the last year 103,144 pages of information were reviewed (that's 951 megabytes of information and graphics). Our old bulletin board system was accessed 1890 times in the past year.

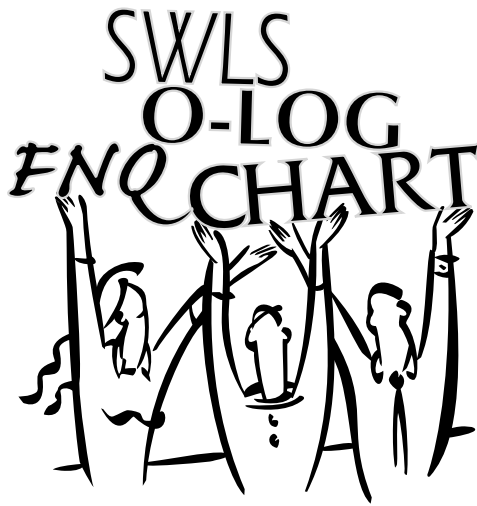
The COMBI logs show that 82% of our users are within the United States and 18% are from other countries. The COMBI is especially popular in Canada, Australia, the United Kingdom, and Italy.

The COMBI continues to be wildly successful as a dissemination effort. In the past year over 17,500 accesses to information about specific scales were logged. Not too many years ago, that information would have to be sent through the regular postal service. That's a big savings in postage alone, not to mention photocopying and staff time. Itemized scale activity is summarized in the table below (but please, no waging). ☑

Scale Activity (Number of Accesses) July 1999–June 2000

Scale	Number of Accesses
ABS	1379
CHART	345 <i>Added 3/28/00</i>
CIQ	1108
CNC	862 <i>Added 9/1/99</i>
DRS	1713
FAM	1518
FIM	3286
FNQ	616 <i>Added 2/1/00</i>
GOS	1476
LCFS	1098
MPAI	724
NFI	832
O-LOG	588 <i>Added 2/1/00</i>
PCRS	920
SRS	824
SWLS	320 <i>Added 3/28/00</i>

The New Additions to The COMBI



Four Scales Added in the Last Six Months

As the COMBI continues to grow, we will continue to add additional scales. In deciding which scales get included, we examine established popular scales as well as new and promising measures. Many times the information you see is provided by the scale author, other times they are compiled by the research staff from the nine collaborating TBI Model System Projects. If you know of a measure you would like to see included, email us at <combi@tbims.org>.

In the last six months we have added four additional measures. These four scales cover quite a bit of ground: handicap, family needs, orientation, and satisfaction with life. A brief synopsis of each measure follows.

THE CRAIG HANDICAP ASSESSMENT AND REPORTING TECHNIQUE

The Craig Handicap Assessment and Reporting Technique (CHART) (Whiteneck et al, 1992) was designed to provide a simple, objective measure of the degree to which impairments and disabilities result in handicaps in the years after initial rehabilitation. The CHART includes domains to assess six dimensions of handicap: 1) Physical Independence: ability to sustain a customarily effective independent existence; 2) Mobility: ability to move about effectively in his/her surroundings; 3) Occupation: ability to occupy time in the manner customary to that person's sex, age, and culture; 4) Social Integration: ability to participate in and maintain customary social relationships; 5) Economic Self-Sufficiency: ability to sustain customary socio-economic activity and independence; and 6) Cognitive Independence: ability to orient oneself to his/her surroundings.

There are a total of 32 questions that cover the six domains. Each of the domains or subscales of the CHART has a maximum score of 100 points, which is considered the level of performance typical of the average non-disabled person.

THE FAMILY NEEDS QUESTIONNAIRE

Many have recognized that brain injury impacts family members as well as the person with the injury. For many survivors, families assume the long-term responsibility of helping them return to an active life. Furthermore, injury-related changes disrupt family members' lives, often eliciting a long-term process of emotional turmoil, confusion, and grieving. The Family Needs Questionnaire (Kreutzer & Marwitz, 1989) was developed to provide information about family members' unique needs after traumatic brain injury. Information is collected regarding perceptions of: (1) the importance of needs; and (2) the extent to which each need has been met.

The FNQ includes 40 items representing diverse needs that may arise during acute rehabilitation, soon after discharge, and in the long-term. Factor analytically derived scales include: Health Information, Emotional Support, Instrumental Support, Professional Support, Community Support Network, and Involvement with Care. Family members are asked to indicate the importance of each perceived need and then rate the degree to which the need has been met.

Because the FNQ is proprietary, the complete set of items and the content of the manual are not provided in the COMBI.

THE ORIENTATION LOG

The Orientation Log (O-Log) was developed to measure orientation to time, place, and circumstance in a rehabilitation population. The O-Log can be used for serial assessment of orientation to document changes over time. This can be very helpful in documenting progress that could help justify continuing treatment. The instrument can be used with anyone who is potentially disoriented; the questions are not specific to any disorder. Thus far the O-Log has been used with people experiencing TBI, CVA, tumor, infectious disease, and degenerative disorders.

Each of the 10 questions comprising the O-Log are objectively scored and the scale can be presented in just a few minutes. The scale allows for spontaneous verbal responses, but responses based on cueing and non-verbal communication are possible.

THE SATISFACTION WITH LIFE SCALE

The Satisfaction With Life Scale (SWLS) is a measure of life satisfaction developed by Ed Diener and colleagues (Diener et al, 1985). Life satisfaction is one factor in the more general construct of subjective well being. Theory and research from fields outside of rehabilitation have suggested that subjective well being has at least three components, positive affective appraisal, negative affective appraisal, and life satisfaction. Life satisfaction is distinguished from affective appraisal in that it is more cognitively than emotionally driven. Life satisfaction can be assessed specific to a particular domain of life (e.g., work, family) or globally. The SWLS is a global measure of life satisfaction.

The SWLS consists of 5-items that are completed by the individual whose life satisfaction is being measured. Administration is brief--rarely more than a few minutes--and can be completed by interview (including phone) or paper and pencil response. The instrument should not be completed by proxy, though a proxy can ask questions to the individual and convey answers to an interviewer (for instance, if the respondent can not be interviewed directly by phone). ☑

Whiteneck G, Charlifue S, Gerhart K, Overholser J, Richardson G: Quantifying handicap: a new measure of long-term rehabilitation outcomes. *Archives of Physical Medicine and Rehabilitation* 73: 519-26, 1992.

Diener E, Emmons R, Larsen J, Griffin S: The Satisfaction With Life Scale. *J Personality Assessment* 49:71-75, 1985.

Kreutzer J, Marwitz J: The Family Needs Questionnaire. Richmond, Virginia: **The National Resource Center for Traumatic Brain Injury**: 1989.

Jackson W, Novack T, Dowler R: Effective serial measurement of cognitive orientation in rehabilitation: The Orientation Log. *Archives of Physical Medicine and Rehabilitation* 79: 718-20, 1998.

The FAM: A Scale in Crisis?

The Functional Assessment Measure (FAM), a popular brain-injury addition to the Functional Independence Measure (FIM), has been getting its share of criticism lately. The FAM was developed as an adjunct to the FIM to specifically address the major functional areas that are relatively less emphasized in the FIM, including cognitive, behavioral, communication and community functioning measures. The FAM consists of 12 items. These items do not stand alone, but are intended to be added to the 18 items of the FIM. The total 30 item scale combination is referred to as the FIM+FAM. The FAM has become popular with clinicians because of its ability to better describe cognitive issues. As a research tool, however, the FAM has had its problems.

In 1999 the FAM items were dropped as variables to be collected by the NIDRR national TBI database (17 centers). The rationale behind this decision was tied to findings that the FAM fared little better with ceiling effects or prediction than the FIM in a community setting. Hall et al in 1996 had earlier reported that at one year post-injury 68% of the FIM scores and 58% of the FAM scores were at near-maximum (average of 6.5 per item).

Recent literature is mixed on the FAM. The findings of four recent papers are summarized below.

Gurka et al, 1999

This Australian cross-sectional study looked at the predictive abilities of the cognitive and motor subscales of the FIM and FAM to predict employment (Return to Work Scale or RTW) and community integration (Community Integration Questionnaire or CIQ) at 6 months (n=88) and 2 years (n=79) post injury. What they discovered was that the FAM did not add noticeably over the FIM to predicting CIQ at 6 months (explaining 21-33% of the variance) or 2 years (explaining 3-9% of the variance). For employment the FAM contributed an additional 18% over the FIM in explaining the variance at two years.

Hawley et al, 1999

In this study from the United Kingdom, FIM and FAM data from 965 patients (2268 assessments) from a national database (10 centers) were analyzed by principal component and Rasch analysis. The principal component analysis identified the motor and cognitive subscales (both showing high internal consistency and reliability). Using the Rasch analysis, they concluded that use of untransformed ratings would be appropriate.

Pentland et al, 1999

Physicians (n=94) and consultants (n=70) were surveyed on the FIM+FAM. Eighty nine percent of the physicians and 82% of the consultants found the FIM+FAM to be useful as part of the discharge information.

Linn et al, 1999

In this Canadian study, the effectiveness of the FIM+FAM in protecting against ceiling effects was examined. A Rasch analysis was performed on FIM+FAM data collected on 376 stroke rehabilitation patients. They found that the only FAM items having fewer ceiling effects than FIM items were Community Access and Employability. The authors note that these two items are difficult to rate in an inpatient setting. They conclude that the FAM reduces test efficiency and adds only minimal protection against ceiling effects. ☑

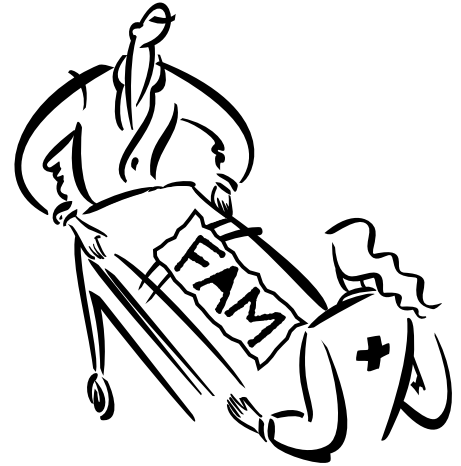
Hall K, Mann N, High W, Wright J, Kreutzer J, Wood D: Functional measures after traumatic brain injury: ceiling effects of FIM, FIM+FAM, DRS, and CIQ. *J Head Trauma Rehabil* 11:27-39, 1996.

Gurka J, Felmingham K, Bauley L, Schotte D, Crooks J, Morosszky J: Utility of the Functional Assessment Measure after discharge from inpatient rehabilitation. *J Head Trauma Rehabil* 14:247-56, 1999.

Hawley C, Taylor R, Hellawell D, Pentland B: Use of the Functional Assessment Measure (FIM+FAM) in head injury rehabilitation: a psychometric analysis. *J Neurol Neurosurg Psychiatry* 67:749-54, 1999.

Pentland B, Hellawell D, Benjamin J: The Functional Assessment Measure (FIM+FAM) as part of the hospital discharge summary after brain injury. *Clin Rehabil* 13:498-502, 1999.

Linn R, Blair R, Granger C, Harper D, O'Hara P, Maciura E: Does the Functional Assessment Measure (FAM) extend the Functional Independence Measure (FIM)? A Rasch analysis of stroke inpatients. *J Outcome Meas* 3:339-59, 1999.



DATA PEEK

The following ceiling effect data comes from an extended follow-up study (Hall et al, in press) where 88 individuals with moderate to severe brain injury were assessed at 5-9 years post injury. * denotes FAM items.

FIM/FAM Item	%Maximum Score (7)
Eating	80%
Grooming	69%
Bathing	68%
Dressing Upper	72%
Dressing Lower	68%
Toileting	78%
Swallowing*	89%
Bladder Management	89%
Bowel Management	89%
Bed Transfer	75%
Toilet Transfer	82%
Tub Transfer	72%
Car Transfer*	70%
Locomotion	68%
Stairs	55%
Community Access*	66%
Comprehension	61%
Expression	54%
Reading*	49%
Writing*	50%
Speech Intelligibility*	81%
Social Interaction	64%
Emotional Status*	45%
Adjustment to Limitations*	69%
Employability*	26%
Problem Solving	53%
Memory	34%
Orientation*	82%
Attention*	56%
Safety Judgement*	73%

Future Directions

The COMBI will continue to add new measures and act as a resource for the rehabilitation community. Planned additional instruments include the American Brain Injury Consortium (ABIC) GOS, the Extended GOS, and the Expanded Rancho (LCFS) Scale.

We are also looking for scales that focus on employment/vocational issues and environmental barriers.

Slow Internet connection? There will soon be a compact disc version of the COMBI available. It will contain all of the forms and background materials available on the website. Stay tuned.

Please email us at <combi@tbi-sci.org> with your thoughts and suggestions. Let us know how we measure up! ☑

Outcome Oriented is a project of the Center for Outcome Measurement in Brain Injury (COMBI) which is funded by the U.S. Department of Education, Office of Special Education and Rehabilitative Services (OSERS), National Institute on Disability and Rehabilitation Research (NIDRR).

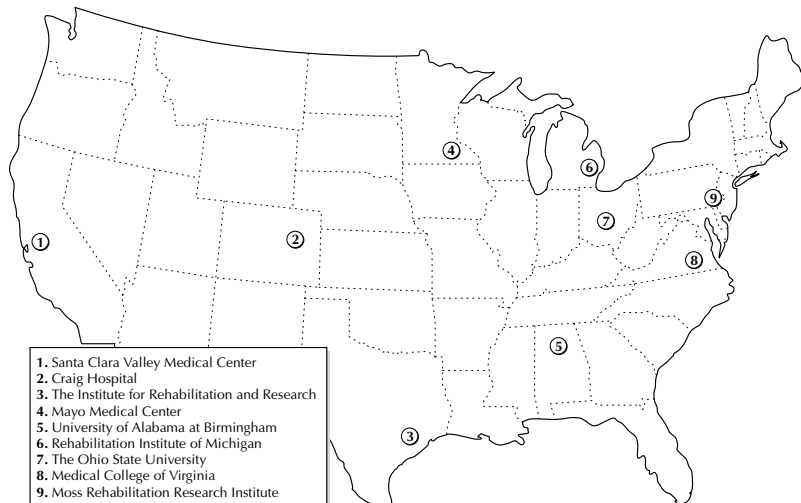
Address inquiries to

Jerry Wright, Editor. PHONE (408) 295-9896 ext 11;
FAX (408) 295-9913; EMAIL combi@tbi-sci.org

This document is available online at:

<www.tbims.org/combi/combinews.html>

CREDIT TO OUR COLLABORATORS



The COMBI is a collaborative project of nine brain injury centers located across the US. Without the expertise of these centers this project would not be possible. We would like to offer special recognition to the individuals at these facilities who have taken the time to prepare materials for the COMBI and act as contacts:

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James F. Malec, PhD, LP at the Mayo Medical Center

Tom Novack, PhD at University of Alabama at Birmingham

Marcel Dijkers, PhD at Mount Sinai School of Medicine
(Formerly at the Rehabilitation Institute of Michigan)

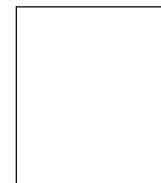
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Rehabilitation Research Center for TBI & SCI
Santa Clara Valley Medical Center
950 South Bascom Avenue, #2011
San Jose, CA 95128



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Center for Outcome Measurement
in Brain Injury (COMBI)
<www.tbims.org/combi>