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reSearch

A collection of research reviews on rehabilitation topics from NARIC and other information resources.

Brain Injury and Community Integration

In previous editions of *reSearch*, we have explored disability rights and legislation, changes in attitudes toward persons with disabilities, rehabilitation paradigms, and community integration. This issue of *reSearch* discusses brain injury; also referred to as head injury, traumatic brain injury (TBI), and acquired brain injury (ABI) as it relates to community re-integration and independent living.

Brain injury has gained further awareness due to the increasing number of soldiers returning with combat-related head trauma, and professional athletes suffering repeated head injuries, specifically professional football players. There are several levels of brain injury: mild, moderate, and severe. While there are a variety of medical classifications for brain injuries, the two most commonly referenced are TBI and ABI. According to the Brain Injury Association of America, TBI and ABI are defined thus:

[TBI] is an insult to the brain, not of a degenerative or congenital nature but caused by an external physical force, that may produce a diminished or altered state of consciousness, which results in an impairment of cognitive abilities or physical functioning. It can also result in the disturbance of behavioral or emotional functioning. These impairments may be either temporary or permanent and cause partial or total functional disability or psychosocial maladjustment.

[ABI] is an injury to the brain, which is not hereditary, congenital, degenerative, or induced by birth trauma. An [ABI] is an injury to the brain that has occurred after birth. ABI commonly results in a change in neuronal activity, which effects the physical integrity, the metabolic activity, or the functional ability of the cell; it may result in mild, moderate, or severe impairments in one or more areas, including cognition, speech-language communication; memory; attention and concentration; reasoning; abstract thinking; physical functions; psychosocial behavior; and information processing. (http://www.biausa.org/Pages/types_of_brain_injury.html, retrieved October 25, 2007 at 11:30 a.m.)

Generally, most people will recovery from a mild to moderate brain injury with minimal long-term affects. A

classic example of mild to moderate brain injury is a concussion. While a concussion may not seem serious, repeated concussions over time, as in the case of professional football players, can cause significant permanent damage. Severe brain injury can cause significant neurological impairment requiring some form of rehabilitation to regain functioning and/or adjust for deficits in functioning.

In the past, persons who suffered a severe brain injury were often placed in mental health facilities and/or nursing homes that lacked the specific training and rehabilitation protocols to help these consumers. There was little to no focus on re-integrating patients with brain injury back into society or encouraging independent living in the community. However, with the disability rights movement and legislation, and the subsequent independent living movement, individuals with brain injury were able to gain specialized treatment in residential settings, and participate in community living.

Included in this edition of *reSearch* are research abstracts, along with links to organizations and research projects, with a focus on community integration following TBI and ABI. The main search terms include: Brain Injury and independent living; Brain Injury and community living; Brain Injury and community integration; and Brain Injury and residential rehabilitation. A listing of over 100 additional descriptor terms between the NARIC and PubMed databases can be found at the end of this document.

Research results are a “snap shot” of the last 10 years of brain injury research with a focus on community integration. The REHABDATA and PubMed databases searches resulted in 38 and 26 documents respectively, both ranging from 2007-1998.

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NIDRR Funded Projects related to Brain Injury and Community Integration:

In addition to document searches, NARIC searched its Program Database of the National Institute on Disability and Rehabilitation Research (NIDRR) projects to locate grantees/projected related to the topic of brain injury and community integration. NIDRR currently funds 13 TBI Model Systems projects across the country, plus a Data Collection Center and a Knowledge Translation Center. NIDRR has funded the TBI Model Systems for more than 20 years. NIDRR-funded projects and their publications are offered as additional resources for our patrons. The following list are the current TBI Model Systems, the Data Collection Center, and Knowledge Translation Center:

University of Alabama at Birmingham (UAB) Traumatic Brain Injury Model System (UAB TBIMS). – Alabama
Project Number: H133A070039
www.uab.edu/tbi

Northern California Traumatic Brain Injury Model System of Care. – California
Project Numbers: H133A020524
www.tbi-sci.org

The Rocky Mountain Regional Brain Injury System (RMRBIS). – Colorado
Project Number: H133A070022
www.craighospital.org/Research/TBIModelsystems.asp

The National Data and Statistical Center for the Traumatic Brain Injury Model Systems. – Colorado
Project Number: H133A060038
www.tbindsc.org

The Spaulding/Partners TBI Model System at Harvard Medical School. – Massachusetts
Project Number: H133A020513
spauldingrehab.org/body.cfm?id=185

Southeastern Michigan Traumatic Brain Injury System (SEMTBIS). – Michigan
Project Number: H133A020515
www.semtbis.org

Mayo Clinic Traumatic Brain Injury Model System. – Minnesota
Project Numbers: H133A020507
www.mayo.edu/model-system

JFK-Johnson Rehabilitation Institute TBI Model System. – New Jersey
Project Number: H133A070030
www.njrehab.org/tbims

New York Traumatic Brain Injury Model System (NYTBIMS). – New York
Project Numbers: H133A020501
www.mssm.edu/tbcentral/nytbims/

Carolinas Traumatic Brain Injury Rehabilitation and Research System (CTBIRRS). – North Carolina
Project Number: H133A070042
www.carolinas.org/services/rehab/CIR/brain_system.cfm

Ohio Regional TBI Model System. – Ohio
Project Numbers: H133A020503
www.ohiovalley.org

The Moss Traumatic Brain Injury Model System. – Pennsylvania
Project Numbers: H133A020505
www.einstein.edu/facilities/mossrehab/index.html

North Texas Traumatic Brain Injury Model System (NT-TBIMS). – Texas
Project Number: H133A070027
www.utsouthwestern.edu/utsw/home/research/neurology/tbi/index.html

Virginia Commonwealth Traumatic Brain Injury Model System. – Virginia
Project Number: H133A070036
www.tbi.pmr.vcu.edu

University of Washington Traumatic Brain Injury Model System. – Washington
Project Number: H133A070032
depts.washington.edu/rehab/tbi

Documents from NARIC's REHABDATA search listed are listed below:

2007

Goverover, Yael. (2007). **Improving self-awareness and functional independence for persons with traumatic brain injury: Investigation of the efficacy of a new therapeutic technique.**

NARIC Accession Number: O16797

ABSTRACT: This study examined the efficacy of an intervention aimed at increasing self-awareness, self-regulation, satisfaction with the therapy process, and functional performance in individuals with TBI. Participants were randomly assigned to either the treatment group, which received self-awareness training while they performed instrumental activities of daily living (IADL) tasks; or to the control group, which performed the same IADL tasks but received conventional therapeutic practice without self-awareness training. Results indicated that the self-awareness intervention significantly helped to improve IADL performance, especially in relation to process skills and self-regulation. The treatment did not significantly improve task-specific self-awareness, general self-awareness, motor aspects of IADL performance, or community integration. No significant differences were found between groups related to satisfaction with treatment.

2006

Abreu, B., Bedell, G., Brown, M., Corrigan, J., Depompei, R., Gordon, W., Kreutzer, J., Sherwin, E., & Whiteneck, G. (2006). **Domains of a TBI minimal data set: Community integration phase.** *Brain Injury, 20*(4), 383-389.

NARIC Accession Number: J50750

ABSTRACT: Article proposes a minimal data set for documenting community integration after TBI. The purpose of the data set is to increase the consistency and interpretability of TBI research and program evaluation by providing a common set of measures to document key aspects of community integration. In deciding on the components of a minimal data set, the tri-partite model of outcomes was adopted which focuses on the needs of the individual, society, and the health care provider.

Bryer, Renee C., Hanks, Robin A., & Rapport, Lisa J. (2006). **Barriers to driving and community integration after traumatic brain injury.** *Journal of Head Trauma Rehabilitation, 21*(1), 34-44.

NARIC Accession Number: J50231

ABSTRACT: Study identified barriers to driving after TBI

and examined the extent to which these barriers affected driving status and community integration. Correlational analyses of driving status, community integration outcomes, and survivor characteristics indicated that drivers had better objective community integration outcomes, reported fewer barriers to driving, and used alternative transportation less often than did non-drivers. Social barriers, such as directives against driving from significant others, accounted for the most variance in driving status among TBI survivors. Decisions to cease driving were more common among those with no formal driving evaluation than among those who had been evaluated.

Hammond, Flora M., Johnston, Mark V., Kreutzer, Jeffrey, Malec, James, & Shawaryn, Marla A. (2006). **The structure of functional and community outcomes following traumatic brain injury.** *Brain Injury, 20*(4), 391-407.

NARIC Accession Number: J50751

ABSTRACT: Rasch analysis was applied to one-year follow-up data from the national Traumatic Brain Injury Model Systems database to identify the dimensions of functional and community outcomes and the items needed to measure these outcomes in TBI research. Items selected for analysis included all items indicative of global outcomes, disability, activity, or participation. Results indicated that functional, psychosocial, and community outcomes after TBI can be measured by a powerful singular general dimension, which might be called "general functioning in the community". This dimension fit over 90 percent of the cases. Item reliability was high, as was person reliability.

High Jr., Walter M., Roebuck-Spencer, Tresa, Sander, Angelle M., Sherer, Mark, & Struchen, Margaret A. (2006). **Early versus later admission to post-acute rehabilitation: Impact on functional outcome after traumatic brain injury.** *Archives of Physical Medicine and Rehabilitation, 87*(3), 334-342.

NARIC Accession Number: J50373

ABSTRACT: Study examined the impact of participation in a post-acute community reentry program on functional outcome for people with TBI based on when they started the program. Participants were divided into three groups based on the length of time between injury and admission to the program: (1) within six months of injury, (2) between 6 and 12 months, and (3) more than 12 months. The program emphasized: (1) teaching compensatory strategies to address residual cognitive deficits, (2) arranging environmental supports to maximize functioning, (3) counseling and education to address personal and family adjustment and to improve accurate self-awareness, and (4) transition from simulated activities in the

clinic to productive activities in the community. All three groups showed improvements between admission and discharge on measures of overall disability, independence, home competency, and productivity. For the group beginning post-acute rehabilitation the earliest, independence continued to improve after discharge.

Kelly, Glenn, Kremer, Peter, Martin, Cheree, Simpson, Grahame, & Todd, Jenny. (2006). **The overt behavior scale (OBS): A tool for measuring challenging behaviors following ABI in community settings.** *Brain Injury*, 20(3), 307-319.

NARIC Accession Number: J50612

ABSTRACT: Article discusses the reliability, validity, and responsiveness of the Overt Behavior Scale (OBS), which was designed to measure challenging behaviors observed after ABI in community settings. The OBS consists of 34 items in 9 categories that measure aggression, inappropriate sexual behavior, perseveration, wandering, inappropriate social behavior, and lack of initiation. Two groups of community-dwelling adults with ABI were used. Group 1 was evaluated on the OBS by two raters and again one week later to test stability. Other validating scales were also administered. Subjects in group 2 participated in a treatment program for challenging behaviors and were administered the OBS before treatment began and again four months later. Inter-rater reliability and stability coefficients for the OBS total score were strong (0.97 and 0.77, respectively). Initial evidence of convergent and divergent validity was shown by the differential pattern of correlations with other measures. Moderate to strong coefficients were observed between the OBS and other measures that had behavioral content. Divergent validity was shown by the lack of correlation between the OBS and the sub-scales of these tools that do not measure challenging behavior. Responsiveness was demonstrated with a significant decrease in OBS scores in the expected direction over the four-month period.

Sloan, Sue, Unsworth, Carolyn, & Winkler, Dianne. (2006). **Factors that lead to successful community integration following severe traumatic brain injury.** *Journal of Head Trauma Rehabilitation*, 21(1), 8-21.

NARIC Accession Number: J50229

ABSTRACT: Forty people were evaluated 3 to 15 years after severe TBI to identify factors that predicted their level of community integration. In addition to collecting demographic and injury data, the Community Integration Questionnaire, the Community Integration Measure, and the Sydney Psychosocial Reintegration Scale were administered. Factors examined as potential predictors included age, sex, years of education, pre-morbid intelli-

gence quotient, pre-morbid employment status, pre-morbid level of community integration, length of post-traumatic amnesia, length of hospital stay, activity limitations, challenging behavior, financial resources, and social support. Discriminant function analyses identified the following factors as predictive of the level of community integration: severity of injury, age at the time of injury, level of disability, and challenging behavior.

2005

Caplan, Bruce, & Zafonte, Ross, eds. (2005). **Focus on clinical research and practice - part 2.** *Journal of Head Trauma Rehabilitation*, 20(5), 393-473.

NARIC Accession Number: R08646

ABSTRACT: Journal issue focuses on research that examines the clinical management and outcomes of patients with TBI. Topics include: characteristics of residential community integration programs, body weight-supported treadmill training versus conventional gait training, subjective reports of fatigue during early recovery from TBI, participant-proxy agreement on community integration status four years after TBI, children's self-efficacy related to physical activity performance, neurobehavioral effects of Amantadine after pediatric TBI, and why neuro-rehabilitation fails. The articles are included separately in the NARIC collection under accession number J49486 through J49492.

Crothers, Ivor R., Linden, Mark A., McCann, John P., & O'Neil, Sheena B. (2005). **Reduced community integration in persons following traumatic brain injury, as measured on the community integration measure: An exploratory analysis.** *Disability and Rehabilitation*, 27(22), 1353-1356.

NARIC Accession Number: J49987

ABSTRACT: Study examined the community integration of individuals with TBI, compared to male and female control subjects. The Community Integration Measure was used to assess levels of community integration in all three groups. Mann-Whitney U tests showed a statistically significant difference between female controls and people with TBI. Females were more integrated into their communities than males, who were more integrated than survivors of TBI.

Dawson, Deirdre R., Markowitz, Michelle, & Stuss, Donald T. (2005). **Community integration status four years after traumatic brain injury: Participant-proxy agreement.** *Journal of Head Trauma Rehabilitation*, 20(5), 426-435.

NARIC Accession Number: J49489

ABSTRACT: Study examined the level of agreement between participants with TBI and their proxies on the Katz Adjustment Scale, a measure of community integration, at four years after injury. Agreement was highest between proxies and participants with mild versus moderate-severe TBIs, between spouse proxies and participants compared to non-spouse proxies, and on the more objective subscales compared to the expectation and satisfaction scales regardless of injury severity or proxy-participant relationship.

Dijkers, Marcel, Goverover, Yael, & Johnston, Mark V. (2005). **Community activities and individuals' satisfaction with them: Quality of life in the first year after traumatic brain injury.** *Archives of Physical Medicine and Rehabilitation*, 86(4), 735-745.

NARIC Accession Number: J48980

ABSTRACT: Study examined the relationship between community activities and satisfaction with these activities, the desires to change them, and global quality of life (QOL) among survivors of TBI. Data were obtained from 162 participants at one month after rehabilitation discharge and 12 months after injury using: (1) the Community Integration Questionnaire-2, augmented by participants' ratings of satisfaction or dissatisfaction with and desire to change each activity; and (2) the Satisfaction With Life Scale. Results showed that most correlations between activities and ratings of global QOL were low and not significant. Correlations between activity-specific satisfaction and general life satisfaction were generally weak and not significant. Dissatisfaction with an activity correlated strongly with desire to change the activity, but general life satisfaction did not correlate with desire to change activities.

Fidler-Sheppard, Rebecca, Hart, Tessa, Kersey-Matusiak, Gloria, Polansky, Marcia, & Whyte, John. (2005). **Community outcomes following traumatic brain injury: Impact of race and pre-injury status.** *Journal of Head Trauma Rehabilitation*, 20(2), 158-172.

NARIC Accession Number: J48889

ABSTRACT: Study examined the influence of pre-injury differences between Whites and African Americans with TBI on their social and community outcomes one year after injury. Results showed that Whites and African Americans did not differ significantly on self-reported pre-injury status or demographic factors except gender. At one year after injury, African Americans reported significantly lower social integration scores and having lost more income than Whites. All other outcome measures were comparable and showed declines in community productivity, increases in symptoms of depression, and lower

satisfaction with life for both groups compared to pre-injury.

Glenn, Mel B., Goldstein, Richard, Rotman, Michelle, & Selleck, Elizabeth A. (2005). **Characteristics of residential community integration programs for adults brain injury.** *Journal of Head Trauma Rehabilitation*, 20(5), 393-401.

NARIC Accession Number: J49486

ABSTRACT: The Community Integration Program Questionnaire was used to obtain data on the characteristics of residential community integration programs for people with brain injury. Results showed significant variability in the areas of staffing, clients, and program characteristics. Staff-to-client ratio ranged from 0.77 to 3.3. Lengths of stay varied from 0.13 to 288 months. Time from injury to admission varied from 0.2 to 180 months.

Glenn, Mel B., Goldstein, Richard, Rotman, Michelle, & Selleck, Elizabeth A. (2005). **Characteristics of home-based community integration programs for adults with brain injury.** *Brain Injury*, 19(14), 1243-1247.

NARIC Accession Number: J49792

ABSTRACT: Representatives from 13 home-based community integration programs for adults with brain injury were interviewed regarding program characteristics and outcomes. Respondents were program directors or other staff familiar with all aspects of the program. Analysis of the data showed considerable variability in the programs' characteristics. Areas in which significant variability could determine outcome differences included: client population, amount of time spent in meetings, time spent with clients' families, and length of stay.

2004

Azulay, Joanne, Cicerone, Keith D., Friel, John C., & Mott, Tasha. (2004). **Community integration and satisfaction with functioning after intensive cognitive rehabilitation for traumatic brain injury.** *Archives of Physical Medicine and Rehabilitation*, 85(6), 943-950.

NARIC Accession Number: J47726

ABSTRACT: Study compared the effectiveness of an intensive cognitive rehabilitation program (ICRP) to standard neuro-rehabilitation (SRP) for people with TBI. Participants in ICRP received an intensive, holistic, highly structured program of integrated cognitive and psychosocial interventions. Participants in SRP received comprehensive neuro-rehabilitation consisting of physical, speech, and occupational therapy and neuro-psychological treatment. Both interventions lasted approximately four

months. The primary measure of effectiveness of treatment was improvement in community integration from before to after treatment. Participants' satisfaction with community functioning was evaluated with the Community Integration Questionnaire (CIQ) and satisfaction with cognitive functioning was evaluated using the Quality of Community Integration Questionnaire. Neuro-psychological functioning was evaluated for the ICRP participants. While both groups showed significant improvement on the CIQ, analysis indicated the ICRP participants were more than twice as likely to show clinical benefits compared to the SRP group. Satisfaction with community functioning was not related to community integration after treatment. ICRP participants showed significant improvement in overall neuropsychological functioning, as did participants who showed significant improvement on the CIQ.

Bertrand, Richard, Dumont, Claire, Fougeyrollas, Patrick, & Gervais, Marie. (2004). **Toward an explanatory model of social participation for adults with traumatic brain injury.** *Journal of Head Trauma Rehabilitation, 19(6)*, 431-444.

NARIC Accession Number: J48413

ABSTRACT: Qualitative and quantitative procedures were used to identify personal resiliency factors that could improve social participation for adults with TBI. Participants filled out questionnaires measuring positive mental states and perceived self-efficacy and answered open-ended questions about their social participation. Multiple regression analyses indicated that dynamism, perceived self-efficacy, and will account for more than half of the variance in social participation and are the main resiliency factors that could improve social participation for people with TBI.

Bogner, Jennifer, & Corrigan, John D. (2004). **Latent factors in measures of rehabilitation outcomes after traumatic brain injury.** *Journal of Head Trauma Rehabilitation, 19(6)*, 445-458.

NARIC Accession Number: J48412

ABSTRACT: Two exploratory factor analyses were conducted to determine whether there is a latent structure among measures currently used to assess community integration, health status, and quality of life outcomes for rehabilitation patients with TBI. The instruments examined were the Community Integration Questionnaire (CIQ), the Craig Handicap Assessment and Reporting Technique (CHART), the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), and the Satisfaction With Life Scale. Both factor analyses suggested three latent factors among these measures: (1) activities, (2) partici-

pation, (3) and subjective well-being. Low to moderate correlations were found between factors. The SF-36, CIQ, and CHART can, in combination, evaluate all three domains, but not alone.

Cicerone, Keith D. (2004). **Participation as an outcome of traumatic brain injury rehabilitation.** *Journal of Head Trauma Rehabilitation, 19(6)*, 494-501.

NARIC Accession Number: J48416

ABSTRACT: Literature review examines the effects of rehabilitation on social participation and community integration for patients with TBI. Author addresses the questions of whether rehabilitation produces clinically significant improvement in community integration, the variability in patterns of community functioning, and the relationship between participation and subjective well-being and quality of life after TBI rehabilitation.

Cicerone, Keith D., Ed. (2004). **Social participation after traumatic brain injury.** *Journal of Head Trauma Rehabilitation, 19(6)*, 429-531.

NARIC Accession Number: R08555

ABSTRACT: Articles in this issue focus on ways in which rehabilitation can affect community integration or social participation outcomes for people with TBI. Topics include: an explanatory model of social participation, latent factors in measures of rehabilitation outcomes, a measure of participation combining outsider and insider perspectives, characteristics of facility-based community integration programs, participation as an outcome of TBI rehabilitation, development of a telephone follow-up program, research with brain-injured subjects, and cognitive side effects of benzodiazepines and antipsychotic drugs. Six of the eight articles are included separately in the NARIC collection under accession numbers J48412 through J48417.

Glenn, Mel B., Goldstein, Richard, Rotman, Michelle, & Selleck, Elizabeth A. (2004). **Characteristics of facility-based community integration programs for people with brain injury.** *Journal of Head Trauma Rehabilitation, 19(6)*, 482-493.

NARIC Accession Number: J48415

ABSTRACT: The Community Integration Program Questionnaire was used to interview 49 outpatient facility-based community integration programs for adults with brain injury. Analysis of the data revealed significant variability in the programs' characteristics. Areas where that variability could affect outcome differences included client population, amount of time spent in team meetings, and length of stay.

Gordon, Wayne A. (2004). **Community integration of people with traumatic brain injury: Introduction.** *Archives of Physical Medicine and Rehabilitation*, 85(4, Suppl 2), S1-S2.

NARIC Accession Number: J46444

ABSTRACT: Introduces a series of articles focusing on research conducted by the Rehabilitation Research and Training Center (RRTC) on Community Integration of Individuals with Traumatic Brain Injury (TBI). The articles address the following topics: methods of implementing a research program within a participatory action research framework, insider-outsider power relationships within measurement, a review of quality of life research on individuals with TBI, two articles summarizing research on depression, an evaluation of a method for identifying TBI in schoolchildren, a study of aging in people with TBI, an evaluation of an innovative community-based vocational rehabilitation program, and a description of findings from a follow-up study of individuals hospitalized with TBI. The articles are included separately in the NARIC collection under accession numbers J46447, J46450 through J46455, J46463 and J46574.

Jaffe, Kenneth M., Ed. (2004). **Community integration of people with traumatic brain injury.** *Archives of Physical Medicine and Rehabilitation*, 85(4, Suppl 2), S1-S82.

NARIC Accession Number: R08521

ABSTRACT: Issue focuses on research conducted by the Rehabilitation Research and Training Center (RRTC) on Community Integration of Individuals with TBI. Articles address the following topics: methods of implementing a participatory action research framework, power relationships within measurement research, a review of quality of life research on individuals with TBI, two articles summarizing research on depression, an evaluation of a method for identifying TBI in schoolchildren, a study of aging in people with TBI, an evaluation of an innovative community-based vocational rehabilitation program, and a description of findings from a follow-up study of individuals hospitalized with TBI. Articles are included separately in the NARIC collection under accession numbers J46444, J46447, J46450 through J46455, J46463 and J46574.

2003

Bennett, Chantel M., Huebner, Ruth A., Johnson, Kerrie, & Schneck, Colleen. (2003). **Community participation and quality of life outcomes after adult traumatic brain injury.** *American Journal of Occupational Therapy (AJOT)*, 57(2), 177-185.

NARIC Accession Number: J47101

ABSTRACT: Study examined outcomes for adults with TBI that are relevant to occupational therapy (OT). Participants completed measures of disability, community participation, quality of life, and satisfaction with OT during a telephone interview. At follow-up participants were often unemployed, depressed and withdrawn, and experienced limitations in decision making, hand use, bladder control, and community integration. Less disability and more community participation were related to higher quality of life. Satisfaction with OT was unrelated to most outcomes.

Bode, Rita K., Sokol, Kara, Corrigan, John D., Doninger, Nicholas A., Heinemann, Allen W., & Moore, Dennis. (2003). **Predicting community integration following traumatic brain injury with health and cognitive status measures.** *Rehabilitation Psychology*, 48(2), 67-76.

NARIC Accession Number: J47037

ABSTRACT: Study examined the measurement properties of and the relationships among commonly used measures of cognitive functioning, health status, and community integration in community-dwelling individuals with TBI. Rating scale analyses were conducted on data collected from 289 people with TBI using the following instruments: the Neurobehavioral Cognitive Status Examination (NCSE), the Short Form Health Survey (SF-36), and the Community Integration Questionnaire (CIQ). Regression analyses were conducted to assess the relative contribution of age, gender, health, and cognitive functioning to overall community integration. While calibration of the SF-36 items indicated favorable estimates of item and person fit, poor measurement properties and definitional problems associated with the NCSE and the CIQ weakened the results. Evidence suggests that prediction of rehabilitation outcomes in community-dwelling residents with TBI may benefit from considering characteristics such as physical and emotional health.

Brown, Margaret, Gordon, Wayne A., & Spielman, Lisa. (2003). **Participation in social and recreational activity in the community by individuals with traumatic brain injury.** *Rehabilitation Psychology*, 48(4), 66-274.

NARIC Accession Number: J46422

ABSTRACT: Study identified factors that affect the extent to which individuals with TBI participate in social and recreational activity in the community. Measures of community integration were administered to 279 people with TBI and compared to the same assessments for 224 people with no disability. Results showed that people with TBI are significantly less active in social and recreation

activities than are people with no disability. For people with TBI, greater activity was associated with being single, higher income, less depression, more vocational hours, and greater time since injury.

Buell, Katherine, Carlson, Peter, Johnston, Jane, McColls, Mary A., Minnes, Patricia, & Nolte, Mary L. (2003). **Community integration: A useful construct, but what does it really mean?** *Brain Injury*, 17(1), 149-159.

NARIC Accession Number: J47277

ABSTRACT: Article reviews the major theoretical perspectives on rehabilitation in relation to three measures of community integration: (1) the AIMS (Assimilation, Integration, Marginalization, Segregation) interview, (2) the Community Integration Measure (CIM), (3) and the Community Integration Questionnaire-Revised (CIQ-R). Results of a principal components analysis indicated that the measures are independent and coherent. Significant correlations were not found between total scores on the three measures and problem behavior or quality of life. Analysis of individual items on the scales yielded one significant correlation between the first item on the CIM (sense of belonging) and quality of life. Findings suggest that the AMIS, CIM, and CIQ-R measure different aspects of community integration or more than one constructs. Recommendations regarding a working definition of community integration and future research needs are discussed.

Diller, Leonard, Hennessy, James J., & Rath, Joseph F. (2003). **Social problem solving and community integration in post-acute rehabilitation outpatients with traumatic brain injury.** *Rehabilitation Psychology*, 48(3), 137-144.

NARIC Accession Number: J47025

ABSTRACT: Study examined the relationship between social problem solving (SPS) and community integration in post-acute rehabilitation outpatients with TBI. Forty-five adults with TBI and 15 healthy adults (controls) completed measures of community integration, problem-solving ability, and SPS self-appraisal and performance. Compared with healthy control subjects, subjects with TBI demonstrated poorer problem solving skills, as measured by both conventional neuropsychological and SPS self-appraisal and performance measures. Only the SPS self-appraisal predicted a significant proportion of the variance in community integration.

2002

Hammond, F.M., Sasser, H.C., Wagner, A.K., & Wiercisiewski, D. (2002). **Return to productive ac-**

tivity after traumatic brain injury: Relationship with measures of disability, handicap, and community integration. *Archives of Physical Medicine and Rehabilitation*, 83(1), 107-114.

NARIC Accession Number: J43566

ABSTRACT: Study was conducted to identify factors influencing successful return to productive activity and to understand how return to productive activity one year after TBI relates to measures of impairment, disability, handicap, and community integration. During telephone interviews with 105 participants, data for the Disability Rating Scale and the Community Integration Questionnaire, and pre-morbid and current employment status were obtained. Of the 105 participants, 72 percent achieved return to productive activity (RTPA), associated with the following factors: pre-morbid educational level, pre-morbid psychiatric history, violent mechanism of injury, discharge status after acute hospitalization, prior alcohol and drug use, and injury severity.

2001

Bushnik, T., Cantagallo, A., Hall, K.M., Lakisic-Kazacic, B., & Wright, J. (2001). **Assessing traumatic brain injury outcome measures for long-term follow-up of community-based individuals.** *Archives of Physical Medicine and Rehabilitation*, 82(3), 367-374.

NARIC Accession Number: J41677

ABSTRACT: Study to determine which outcome measures are best and least suited for assessing long-term functional outcome of individuals with TBI living in the community. Participants were 48 community-dwelling adults with TBI, who completed the GOS (Glasgow Outcome Scale), DRS (Disability Rating Scale), FIM (Functional Independence Measure), FIM+FAM (Functional Assessment Measure), CIQ (Community Integration Questionnaire), R-CHART (Revised Craig Handicap Assessment and Reporting Technique), NFI (Neurobehavioral Functioning Inventory), PCRS (Patient Competency Rating Scale), SRS (Supervision Rating Scale), and LCFS (Level of Cognitive Functioning Scale) an average of five years after injury. The number of maximal scores on each measure was used to determine which instruments continued to reveal deficits years after TBI. Results indicate that the FIM, FIM+FAM, SRS, GOS, and LCFS contributed little to the assessment of functional status years after TBI. Measures that showed a range of deficits were the NFI, the PCRS, the DRS employability subscale, and the R-CHART cognition subscale.

Carlson, P., Davies, D., Johnston, J., McColl, M.A., & Minnes, P. (2001). **The Community Integration Measure: Development and preliminary validation.** *Archives of Physical Medicine and Rehabilitation*, 82(4), 429-434.

NARIC Accession Number: J41772

ABSTRACT: Study examines the psychometric properties of a new measure of community integration for individuals with brain injuries and their significant others, the Community Integration Measure (CIM). The CIM was completed by 41 brain injury survivors, 36 significant others, and 15 college students. Distributional properties, factor structure, internal consistency, reliability, content validity, discriminant validity, concurrent validity, and construct validity were determined. Results indicate that the CIM conforms to an empirically derived theoretical model and is psychometrically sound.

2000

Durgin, C.J. (2000). **Increasing community participation after brain injury: Strategies for identifying and reducing the risks.** *Journal of Head Trauma Rehabilitation*, 15(6), 1195-1207.

NARIC Accession Number: J41038

ABSTRACT: Article on evaluation of safety and risk factors of participation in community activities for persons with brain injuries. The article identifies risk factors that people with brain injuries often face, discusses how to assess the level of risk, and reviews strategies that caregivers and clinicians can use to help individuals with brain injuries safely achieve greater and more satisfying levels of community involvement.

1999

Button, J., Rempel, R., & Willer, B. (1999). **Residential and home-based post-acute rehabilitation of individuals with traumatic brain injury: A case control study.** *Archives of Physical Medicine & Rehabilitation*, 80(4), 399-406.

NARIC Accession Number: J36497

ABSTRACT: Study comparing outcomes of severely brain injured individuals treated in a post-acute residential rehabilitation program and a matched sample of individuals receiving limited services in their home or on an outpatient basis. Participants were 23 consecutive individuals admitted to a post-acute residential program, and 23 matched controls chosen from a support group. Participants were evaluated for functional limitations and community integration. Results indicated that the residential treatment group had significantly greater increases in func-

tional abilities than those treated at home. Community integration was also greater for the residential treatment group.

Puchta, J.B., & Weiss, D.M. (1999). **Independent Living Center services for post-hospital traumatic brain injury patients.** *Journal of Cognitive Rehabilitation*, 17(6), 6-12.

NARIC Accession Number: J39033

ABSTRACT: Study examining services provided by federally-funded Independent Living Centers (ILC) to help facilitate the transition from post-hospital care to community living by persons with TBI. Data are from 139 responses to a survey of 428 ILCs in all 50 states. Data include: whether centers provide general or specific services for persons with TBI; types of services provided; TBI issues most frequently addressed by ILCs; services requested but not available; factors related to successful outcomes as judged by ILCs; how successful outcomes are measured; and professional groups utilized by ILCs.

1998

(1998). **Living life after TBI.**

NARIC Accession Number: O14332

ABSTRACT: Five-component questionnaire designed for individuals with TBI living in the community. Components cover: (1) basic data; (2) brain injury data; (3) health, exercise, pain, and service data; (4) experiencing community living; and (5) perceptions of self and well being/quality of life. This resource is only available with technical assistance from the Research and Training Center on Community Integration of Individuals with TBI, Mt. Sinai School of Medicine, New York City.

Beckers, K., Greenwood, R.J., & Powell, J.H. (1998). **Measuring progress and outcome in community rehabilitation after brain injury with a new assessment instrument—The BICRO-39 Scales.** *Archives of Physical Medicine and Rehabilitation*, 79(10), 1213-1215.

NARIC Accession Number: J37269

ABSTRACT: Study constructs and examines the Brain Injury Community Rehabilitation Outcomes Scales, (BICRO-39), an instrument for assessing problems experienced by brain-injured patients living in the community. A review of existing scales and definitions from the International Classification of Impairments, Disabilities, and Handicaps generated 76 items describing aspects of personal and social functioning. Each of these items was rated on a 6-point scale by 235 patients with ABI and/or their caregivers; patients retrospectively rated their functioning before injury. Seven scales were derived from

factor analysis; one was included a priority. Thirty-nine items with high factor loading were kept. The instrument was then examined for test-retest and inter-rater reliability as well as construct validity. Of the 235 patients, 127 had TBI, 72 had cerebro-vascular accidents, 15 had multiple sclerosis, and 21 had ABI of other origins. Mean age was 43 years, 164 participants were men and 71 were women, and the mean time since brain injury was 2.6 years. The scales showed good test-retest reliability and there was a moderate to high agreement between patient and caregiver. Generally high correlations were noted between some BICRO scales and other scales which assess aspects of disability.

Braunling-McMorrow, D., McMorrow, M.J., & Smith, S. (1998). **Evaluation of functional outcomes following proactive behavioral-residential treatment.** *Journal of Rehabilitation Outcomes Measurement*, 2(2), 22-30.

Article NARIC Accession Number: J35138

ABSTRACT: Article about the effects of a proactive behavioral treatment program on the functional outcomes of persons with ABI and serious emotional/behavioral problems. Data were obtained for 71 persons in a residential treatment program regarding seven outcome areas, including residential status, level of awareness, community participation, and involvement in productive activities such as education and work. The intervention used was the PEARL model, which combines cognitive, behavioral, and medical approaches. It was found that all seven outcome areas were positively affected at discharge when compared to preadmission measures, and that further gains occurred during a one-year follow up period.

Brown, M., Flanagan, S., Gordon, W.A., Hibbard, M.R., & Korves, M.C. (1998). **Community integration and quality of life of individuals with traumatic brain injury.** *In Rehabilitation of the Adult and Child with Traumatic Brain Injury*, 3rd edition, 312-325. Philadelphia: F.A. Davis.

NARIC Accession Number: J37060

ABSTRACT: Chapter increases knowledge about individuals living in the community with TBI. Reviews previous studies of people with TBI in the community. Focuses on the findings of an ongoing quality of life study to determine what are the characteristics of persons with TBI living in the community; and what is the overall quality of life for them. Discusses the range of services needed by individuals with TBI, public policy affecting these services, and the impact of managed care.

Brown, M., & Vandergoot, D. (1998). **Quality of life for individuals with traumatic brain injury: Comparison with others living in the community.** *Journal of Head Trauma Rehabilitation*, 13(4), 1-23.

NARIC Accession Number: J35537

ABSTRACT: Article comparing quality of life (QOL) for persons with TBI, spinal cord injury (SCI), and no disability. Data are from two QOL indicators, one measuring emotion-based views of QOL and the other measuring perceptions of total unmet important needs, administered to individuals living in diverse communities in New York State. Participants included 430 persons who identified themselves as having TBI, 101 persons with SCI, and 187 persons who identified themselves as having no disability. Findings include the following: Both summary QOL indicators were correlated with demographic characteristics. Unmet important needs were stronger in the TBI group than in the SCI and no disability groups. Analyses of covariance showed that severity of injury was a more powerful modulator of post-TBI QOL judgments than the mere fact of TBI. For example, those with the most severe TBI (i.e., loss of consciousness > one month) rated their QOL about the same as did people in the no disability group, while individuals who had experienced only a brief loss of consciousness (< 20 minutes) viewed their QOL as significantly lower than did persons in the SCI and no disability groups and persons in other TBI severity subgroups.

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Documents from the National Library of Medicine PubMed search at www.pubmed.com are listed below:

2007

Eliasson, A.C., Imms, C., Mastos, M., & Miller, K. (2007). **Goal-directed training: Linking theories of treatment to clinical practice for improved functional activities in daily life.** *Clinical Rehabilitation*, 21(1), 47-55.

PMID #: 17213241

ABSTRACT: BACKGROUND: Goal-directed training is an activity-based approach to therapy.

Meaningful, client-selected goals are used to provide opportunities for problem solving and to indirectly drive the movements required to successfully meet the task demands. This is in contrast to interventions that focus on changing body functions. Here, the principles of goal-directed training will be studied through two case studies with the aim of linking theories of treatment to clinical practice. **PRINCIPLES ILLUSTRATED:** The approach is based on the dynamic systems motor control theory and occupation-based therapy models, which suggest that movement patterns emerge from the interaction between the person's abilities, environment, and the goal. Motor learning principles are applied to structure and schedule practice. **THEORY IN PRACTICE:** Four components provide the basis for goal-directed training: (1) selection of a meaningful goal; (2) analysis of baseline performance; (3) intervention/ practice regime; and (4) evaluation of outcome. Two individuals with ABI practiced self-care tasks: eating and tying hair into a ponytail. Intensive training was undertaken over four weeks and the intervention outcome measured using the Goal Attainment Scale. **CONCLUSIONS:** The positive achievements in the self-care tasks illustrated that theories of motor control and motor learning can be applied to goal-directed training. The examples demonstrated that the approach could be applied to individuals with a range of abilities.

Fisher, A.G., & Waehrens, E.E. (2007). **Improving quality of ADL performance after rehabilitation among people with acquired brain injury.** *Scandinavian Journal of Occupational Therapy*, 22, 1-8 [Epub ahead of print].

PMID #: 17852966

ABSTRACT: The aim of this study was to evaluate whether people with brain injury show improvements in quality of performance of activities of daily living (ADL) after rehabilitation. A retrospective pre- and post-test design with no control group was used. Subjects received interdisciplinary rehabilitation consisting of restorative and

compensatory strategies. Thirty-six adults with moderate to severe disability following ABI were evaluated using the Assessment of Motor and Process Skills, an observational evaluation of the quality of ADL task performance. Paired t-tests revealed significant increase in ADL ability after intervention; effect sizes were medium. Improvements occurred across ages, within all diagnostic groups, and with no relation to time post-injury. It was concluded that people with moderate to severe disability following ABI improved in ADL ability after participating in an intensive, interdisciplinary rehabilitation program. Although lack of a control group prevented a conclusively conclusion that the changes were due to the intervention provided, the fact that the subjects had shown slow spontaneous recovery and minimal improvements before the study was implemented supports the likelihood that their gains were largely the result of the intervention.

Lefering, R., Lippert-Grüner, M., & Svestkova, O. (2007). **Functional outcome at one vs. two years after severe traumatic brain injury.** *Brain Injury*, 21(10), 1001-5. PMID #: 17891561

ABSTRACT: Purpose: The aim of the study was to evaluate the outcome of patients with severe TBI after 12 and 24 months (Glasgow Coma Scale GCS \leq 8 points for at least 24 hours). **Methods:** A total of 51 patients underwent a multidisciplinary early rehabilitation treatment until they were discharged from hospital and local ambulatory care was deemed sufficient. The follow-up examination took place 12 and 24 months after the STBI. **Results:** Data revealed a high level of independence in activities of daily living (mean Barthel Index after one year 92.7 points, after two years 93.7 points). After one and two years, 74.5 and 80.4 percent of the patients, respectively, were completely independent of need for care. Nevertheless, more than half of the patients had sensory-motor, behavioral, speech, visual and/or auditory disturbances. Return to work rates improved between 1-2 years after trauma, as evidenced by the rate of patients being back to full time work at one year (n = 14, 28%) and two years (n = 20, 40 percent) post-STBI; although none of these changes reached statistical significance. **Conclusion:** In summary, there are still changes in both impairment and disability related areas between 1-2 years post-STBI, but the degree of improvement is variable depending on the area being considered. Clinicians should remain aware of the fact that modulation of impairment and disability appear to continue well beyond one year post-STBI, which may impact on decisions regarding the provision and intensity of further rehabilitation efforts.

Oddy, M., & Parish, L. (2007). **Efficacy of rehabilitation for functional skills more than 10 years after**

extremely severe brain injury. *Neuropsychological Rehabilitation*, 17(2), 230-43.

PMID #: 17454695

ABSTRACT: PURPOSE: To determine whether gains in personal independence can be achieved in individuals 10 or more years after very severe acquired brain injury.

METHOD:

Four individuals in a continuing (slow stream) rehabilitation centre were assessed by an occupational therapist (OT) and programs were designed to help the individual enhance personal independence. Support staff were trained to implement these programs under the guidance of the OT. Methods described by Giles, Ridley, Dill, and Frye (1997) were used. Pre- and post-training measures were taken as well as follow up measures to assess the durability of such changes. RESULTS: The results demonstrate that it is possible to achieve clinically significant improvements in personal independence many years after very severe ABI. CONCLUSIONS: The findings of this study suggest that personally and clinically significant goals can be achieved 10 or more years after brain injury and there should be continuing effort to improve the circumstances of individuals with ABI. Such gains can be achieved through consistent application of such programs by support workers working under the supervision of an occupational therapist.

2006

Hanks, R.A., & Pierce, C.A. (2006). **Life satisfaction after traumatic brain injury and the World Health Organization model of disability.** *American Journal of Physical Medicine & Rehabilitation*, 85(11), 889-98. PMID #: 17079961

ABSTRACT: OBJECTIVE: To determine which components of the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) are most predictive of global life satisfaction after TBI. DESIGN: Prospective evaluation of 180 individuals enrolled in a TBI model system project site. RESULTS: Multiple regression analysis indicated that the combination of ICF components (body function and structure, activities, and participation) and demographic factors significantly predicted life satisfaction and accounted for 17 percent of the variance. Participation was the strongest predictor; activities were a significant, but weaker predictor; and body function and structure did not add to the prediction of life satisfaction. Of all the individual variables evaluated, only social integration and productivity were found to be significant, unique predictors. CONCLUSIONS: When considering the effects of various aspects of disabling conditions on the life satisfaction of

individuals who have suffered a TBI, restriction of participation in life activities was found to have the greatest impact. Although the model accounted for a significant percentage in the variation of life satisfaction; a large proportion of the predictive picture (>82 percent) remains unclear. Doubtless, other variables impinge on life satisfaction that would further clarify the complex relationship between disabling conditions and life satisfaction in TBI.

Harrington, H., Olver, J., Ponsford, J., & Roper, M. (2006). **Evaluation of a community-based model of rehabilitation following traumatic brain injury.** *Neuropsychological Rehabilitation*, 16(3), 315-28.

PMID #: 16835154

ABSTRACT: In recent years there has been a growing trend towards community-based post-acute rehabilitation for individuals with TBI, as opposed to the traditional centre-based model, based on the premise that these individuals will learn more effectively in settings where they usually have to perform. In the present study, outcomes at two years post-injury in 77 individuals with TBI, treated within the community were compared on measures of activities of daily living (ADL), vocational status, and emotional adjustment with those of 77 TBI patients individually matched for gender, age, education, occupation, post-traumatic amnesia duration, Glasgow Coma Scale score and time in inpatient rehabilitation, who had attended the hospital for outpatient therapy. There were no significant differences between groups in terms of employment outcomes or independence in personal or domestic ADL. However those treated in the community were less likely to be independent in shopping and financial management and reported more changes in communication and social behavior. Due to constraints of time and resources, these patients had received fewer one-on-one therapy sessions and thus treatment costs were somewhat lower. Attendant care costs were also lower in the community treatment group. Strengths and weaknesses of community-based post-acute rehabilitation are discussed.

2005

Abreu, B.C., & Reistetter, T.A. (2005). **Appraising evidence on community integration following brain injury: A systematic review.** *Occupational Therapy International*, 12(4), 196-217.

PMID #: 16485508

ABSTRACT: A systematic review of the community integration (CI) literature for persons with TBI was undertaken to evaluate: (1) how do we best measure CI?; (2)

can we predict CI following rehabilitation?; (3) does social and activity participation have an effect on CI?; and (4) does CI have an effect on quality of life/life satisfaction? Seventy-two articles were analyzed. The results demonstrated: (1) strong evidence supporting the use of the Community Integration Questionnaire (CIQ), and (2) mixed evidence supporting the ability to predict CI, with the prominent predictive variables being severity of injury, age, gender, education, prior work, living environment, cognition, emotional status, functional performance and disability. The literature search was restricted to articles published in English and the heterogeneity in the outcomes, methods, participants and other characteristics not reported. Further research is needed to examine the complex relationship of person, environment and CI.

Azouvi, P., Dazord, A., & Mailhan, L. (2005). **Life satisfaction and disability after severe traumatic brain injury.** *Brain Injury, 19*(4), 227-38.

PMID #: 15832869

ABSTRACT: OBJECTIVE: To assess the relationships between life satisfaction and disability after a severe TBI. DESIGN: Cross-sectional study, including 75 patients two years or more after a severe TBI. METHODS: Life satisfaction was assessed with the Subjective Quality of Life Profile. Impairments, activities and participation were assessed with standardized tests. RESULTS: The satisfaction profile was flat, i.e. the majority of items obtained mean satisfaction scores close to zero, suggesting that participants felt indifferent to these items or in other words that they were neither satisfied nor unsatisfied. Patients were on average slightly dissatisfied with their cognitive functions, physical abilities and self-esteem. A factor analysis revealed three underlying factors. The main finding was that the relationships between life satisfaction and disability were not linear: the lowest satisfaction scores were reported by participants with moderate disability rated by the Glasgow Outcome Scale, while individuals with severe disability did not significantly differ from the good recovery group. CONCLUSION: Life satisfaction is not linearly related to disability after severe TBI.

Foster, M., Hanna, J., Kendall, M., Kuipers, P., & Simpson, G. (2005). **An organizational perspective on goal setting in community-based brain injury rehabilitation.** *Disability and Rehabilitation, 27*(15), 901-10.

PMID #: 16096242

ABSTRACT: PURPOSE: To use an taxonomy of goal content, developed in community-based brain injury rehabilitation to examine and compare the content of goals set within two different service settings; and to further examine the potential of the taxonomy to be a reliable and

comprehensive framework for classifying goals. METHOD: Qualitative analysis and categorization of 1492 goal statements extracted from a community-based brain injury rehabilitation service over two time periods (1996-97, 1998-99), and cross-organizational comparison of ratings of goal classifications using a random sample of 100 goal statements drawn from this data set and the original 1765 goal statements used in developing the taxonomy. RESULTS: Application of the taxonomy beyond the original service setting in which it was developed indicated a strong inter-rater reliability, with a high test-retest agreement reported over time. For both services, a small number of categories accounted for a substantial proportion of goals set within the two time periods, while considerable change was evident in goals between the two periods for one service. Further, both placed emphasis on individually focused goals rather than relationship or family-related goals. CONCLUSION: The taxonomy provides a reliable means for classifying goals and is a useful tool for exploration of the multiple influences on goal setting. Further application of the taxonomy to examine the relative influence on goal setting of client factors versus a range of organizational factors would be beneficial.

2004

Al-Adawi, S., Burke, D.T., Dorvlo, A.S., & Shah, M.K. (2004). **Functional outcomes following anoxic brain injury: A comparison with traumatic brain injury.** *Brain Injury, 18*(2), 111-7.

PMID #: 14660224

ABSTRACT: PRIMARY OBJECTIVE: To compare the functional outcomes of patients with anoxic brain injury (ABI) and patients with TBI following inpatient rehabilitation. RESEARCH DESIGN: Retrospective chart review. METHODS AND PROCEDURES: Data on 68 patients with brain injury (34 with ABI and 34 with TBI) were collected. MAIN OUTCOMES AND RESULTS: The ABI and TBI groups were demographically similar, except that patients with ABI were more likely to be married. Both groups significantly improved their function and were similar upon discharge. For the ABI group, there were trends toward a shorter length of stay, increased total FIM efficiency and decreased cost of stay when compared with the TBI group. The patients with ABI tended to be discharged to a sub-acute rehabilitation facility more than those in the TBI group. CONCLUSIONS: This study is important because it shows that patients with ABI benefit from inpatient rehabilitation and made significant functional gains comparable to the gains of patients with TBI.

Bartfai, A., Boman, I.L., Hemmingsson, H., & Lindstedt, M. (2004). **Cognitive training in home environment.** *Brain Injury, 18*(10), 985-95.

PMID #: 15370898

ABSTRACT: PRIMARY OBJECTIVE: To examine the efficacy of cognitive rehabilitation in the patient's home or vocational environment. Research design: Pre-post-follow-up design. METHODS AND PROCEDURES: Ten outpatients with acquired attention and memory problems received cognitive training three times weekly, for three weeks. They received individual attention training with Attention Process Training, training for generalization for everyday activities and education in compensatory strategies for self-selected cognitive problems. Treatment effects were evaluated with neuropsychological and occupational therapy instruments before and after the training and after three months on impairment, activity and participation levels. MAIN OUTCOMES AND RESULTS: The results indicated a positive effect on some measures on impairment level, but no differences on activity or participation levels at follow-up. CONCLUSIONS: The study indicates that home-based cognitive training improves some attention and memory functions and facilitates learning of strategies. Future controlled studies are needed to confirm the results and analyze the efficacy of different aspects of home-based training.

2003

Baguley, I.J., Cameron, I.D., & Khan, F. (2003). **Rehabilitation after traumatic brain injury.** *Medical Journal of Australia, 178*(6), 290-5.

PMID #: 12633489

ABSTRACT: TBI commonly affects younger people and causes life-long impairments in physical, cognitive, behavioral, and social function. The cognitive, behavioral, and personality deficits are usually more disabling than the residual physical deficits. Recovery from TBI can continue for at least five years after injury. Rehabilitation is effective using an interdisciplinary approach, and close liaison with the patient, family and careers. The focus is on issues such as retraining in activities of daily living, pain management, cognitive and behavioral therapies, and pharmacological management. The social burden of TBI is significant; and therefore family education and counseling, and support of patient and careers, is important. General practitioners play an important role in providing ongoing support in the community, monitoring for medical complications, behavioral and personality issues, social reintegration, career coping skills and return-to-work issues.

2002

Becker, C., Caroselli, J.S., High, W.M., Jr., Neese, L., Sander, A.M., & Scheibel, R. (2002). **Relationship of family functioning to progress in a post-acute rehabilitation program following traumatic brain injury.** *Brain Injury, 16*(8), 649-57.

PMID #: 12182162

ABSTRACT: PRIMARY OBJECTIVE: To investigate the relationship of family functioning to patients' progress in a post-acute TBI rehabilitation program. RESEARCH DESIGN: Cohort study investigating predictors of change from admission to follow-up. METHODS AND PROCEDURES: Caregivers of 37 persons with severe TBI consecutively admitted to a residential post-acute rehabilitation facility completed the Family Assessment Device (FAD) within a few weeks of admission. The Disability Rating Scale (DRS) was completed upon admission and approximately one month after discharge. FAD scores were used to predict DRS change scores after controlling for injury severity, admit FAD scores, and time from admission to follow-up. MAIN OUTCOMES AND RESULTS: Persons with unhealthy family functioning showed less improvement on DRS total, level of functioning, and employability scores. CONCLUSIONS: The results emphasize that family functioning is an important variable to include in future models predicting rehabilitation outcome, and the importance of family intervention as part of the rehabilitation process.

Chute, D.L., Hillary, F.G., Moelter, S.T., & Schatz, P. (2002). **Retrospective assessment of rehabilitation outcome after traumatic brain injury: Development and utility of the functional independence level.** *Journal of Head Trauma Rehabilitation, 17*(6), 510-25.

PMID #: 12802242

ABSTRACT: OBJECTIVE: To develop a measure suitable for retrospective analysis of qualitative brain injury outcome data, the Functional Independence Level (FIL), and document its reliability, validity, and utility. DESIGN: Retrospective analysis of existing records, with inclusion based on availability of records, and quantitative or qualitative documentation of functional status at a minimum of one and half years after injury. SETTING: State-wide acute and post-acute rehabilitation facilities, as part of a State Head Injury Program. PARTICIPANTS: A total of 338 individuals, with documented moderate to severe TBI; primarily males ages 16 to 45. MAIN OUTCOME MEASURES: Disability Rating Scale (DRS) at discharge from primary rehabilitation, Living Situation and Functional Independence Level coded from information in post-acute rehabilitation reports, at an average of approximately

six years after injury. RESULTS: Inter-rater reliability coefficients for FIL ratings extracted from rehabilitation records, and between retrospective and in vivo assessments were highly significant. DRS scores at discharge from primary rehabilitation predicted a significant amount of variance in FIL scores at an average of five years after injury, and DRS scores remained a stable and significant predictor of FIL scores as the time period between discharge from rehabilitation and outcome ratings increased to 10 years after injury. FIL ratings were significantly lower for individuals living in residential facilities than those living with their families, as compared to living alone. CONCLUSIONS: The FIL is a reliable and useful tool for retrospective and prospective assessments of rehabilitation outcome. Gains made during primary rehabilitation by people with severe TBI are generally maintained at long-term follow up. Retrospective ratings using the DRS and FIL can help guide post-acute rehabilitation planning within state or regional head injury programs.

Greenwood, R., Heslin, J., & Powell, J. (2002). **Community-based rehabilitation after severe traumatic brain injury: A randomized controlled trial.** *Journal of Neurology, Neurosurgery, & psychiatry*, 72(2), 193-202.

PMID #: 11796769

ABSTRACT: OBJECTIVE: Evaluation of multidisciplinary community based outreach rehabilitation after severe TBI. METHODS: A randomized controlled trial compared outreach treatment (mean of two sessions a week for 27.3 (SD 19.1) weeks) in community settings such as participants' homes, day centers, or workplaces, with provision of written information detailing alternative resources. Follow up for an average of 24.8 months after initial allocation was by a blinded independent assessor. Participants were aged 16-65, had sustained severe TBI between 3 months and 20 years previously, and had no other neurological conditions. Of 110 initially allocated; 48 outreach and 46 information participants were successfully followed up. Primary outcome measures (Barthel index (BI) and the brain injury community rehabilitation outcome-39 (BICRO-39)) focused on levels of activity and participation. Secondary measures were the functional independence measure and the functional assessment measure (FIM+FAM) and, in a subgroup of 46 participants, the hospital anxiety and depression scale. Analyses were non-parametric. RESULTS: outreach participants were significantly more likely to show gains on the BI and the BICRO-39 total score and self organization and psychological wellbeing subscales. There were likewise strong trends ($p < 0.10$) for BICRO personal care and mobility, and on the FIM+FAM for personal care and

cognitive functions. Differential improvements were not seen for indices of socializing, productive employment, anxiety, or depression. Median changes on individual subscales were small, reflecting the diversity of the clinical population; however, 40 percent of outreach but only 20 percent of information participants made a clinically significant improvement of 2+ points on at least one BICRO-39 scale. Time since injury was unrelated to the magnitude of gains. CONCLUSIONS: This is the first RCT of multidisciplinary community rehabilitation after severe TBI, and suggests that even years after injury it can yield benefits which outlive the active treatment period.

2001

Ashley, M.J., Clark, M.C., & Persel, C.S. (2001). **Validation of an independent living scale for post-acute rehabilitation applications.** *Brain Injury*, 15(5), 435-42.

PMID #: 11350657

ABSTRACT: The Independent Living Scale (ILS) was developed in a post-acute TBI rehabilitation facility over a 15-year period to assess three main areas: (1) activities of daily living, (2) behavior, and (3) initiation. The purpose of this study was to examine the psychometric properties of the ILS, including test—retest stability, construct validity, and statistical fit. Statistical analysis was completed on all weekly scores between the years 1986-1995 ($n = 5250$). A previous study showed ILS inter-rater reliability to be 0.85 and convergent validity 0.82—0.87. This study demonstrated a test—retest stability of 0.72, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy 0.94 (marvelous), and a Bartlett Test of Sphericity result of 'scale items independent'. The ILS was shown to have good construct validity, inter-rater reliability, internal consistency, instrument stability, and convergent validity.

Doig, E., Fleming, J., & Tooth, L. (2001). **Patterns of community integration 2-5 years post-discharge from brain injury rehabilitation.** *Brain Injury*, 15(9), 747-62.

PMID #: 11516344

ABSTRACT: Outcome after TBI is characterized by a high degree of variability which has often been difficult to capture in traditional outcome studies. The purpose of this study was to describe patterns of community integration 2-5 years after TBI. Participants were 208 patients admitted to a Brain Injury Rehabilitation Unit, between 1991-1995 in Brisbane, Australia. The design comprised retrospective data collection and questionnaire follow-up by mail. Mean follow-up was 3.5 years. Demo-

graphic, injury severity and functional status variables were retrieved from hospital records. Community integration was assessed using the Community Integration Questionnaire (CIQ), and vocational status measured by a self administered questionnaire. Data was analyzed using cluster analysis which divided the data into meaningful subsets. Based on the CIQ subscale scores of home, social and productive integration, a three cluster solution was selected, with groups labeled as working (n = 78), balanced (n = 46) and poorly integrated (n = 84). Although 38 percent of the sample returned to a high level of productive activity and 22 percent achieved a balanced lifestyle, overall community integration was poor for the remainder. This poorly integrated group had more severe injury characterized by longer periods of acute care and post-traumatic amnesia and greater functional disability on discharge. These findings have implications for service delivery prior to and during the process of reintegration after brain injury.

2000

Burnham, R.S., & Gray, D.S. (2000). **Preliminary outcome analysis of a long-term rehabilitation program for severe acquired brain injury.** *Archives of Physical Medicine and Rehabilitation*, 81(11), 1447-56.

PMID #: 11083347

ABSTRACT: OBJECTIVES: To describe the general characteristics and functional outcomes of individuals treated in a publicly funded, long-term, ABI rehabilitation program and investigate variables affecting functional outcomes in this patient population. DESIGN: Retrospective database review of demographic, descriptive, and functional outcome assessment data. SETTING: Publicly funded, comprehensive, multidisciplinary, long-term, residential brain injury rehabilitation program in Alberta, Canada (64 beds). PATIENTS: All rehabilitation patients admitted to and discharged from the brain injury program from February 1991 to March 1999 (n = 349). INTERVENTIONS: Multidisciplinary rehabilitation program. MAIN OUTCOME MEASURES: Demographic and descriptive information included sex, age at admission, type and severity of injury, time from injury to long-term program admission, and length of stay (LOS). Functional outcome information included level of care required at admission and discharge, admission and discharge Rappaport disability rating scale scores, and admission and discharge FIM instrument and Functional Assessment Measure scores for a subset of patients. RESULTS: Fifty-nine percent of the subjects had severe traumatic brain injuries (TBI) and 41 percent had severe non-traumatic brain injuries (NTBI) of various causes. Mean age at admission was older and LOS was longer for NTBI compared with TBI; there were no other differences

between the groups in demographic or descriptive measures. The TBI group had significantly lower admission motor subscale scores than the NTBI group, but the groups did not differ on cognitive scores. All functional assessment measures showed statistically significant improvement from admission to discharge, and 85.6 percent of patients were discharged to community living after a mean LOS of 359.5 days. Functional status at admission, age at admission, length of time between injury and admission, and LOS in the rehabilitation program significantly correlated with functional improvement. CONCLUSIONS: Patients with severe TBI and NTBI who were not candidates for other more conventional forms of rehabilitation showed significant improvement in functional outcomes after extended program admissions. Consideration was also given to the potential insensitivity of commonly used outcome assessment measures in this population.

Coyle, M., Martin, E.M., Salazar, A.M., Schwab, K.A., Walter, J., & Warden, D.L. (2000).

A home program of rehabilitation for moderately severe traumatic brain injury patients. The DVHIP study group. *Journal of Head Trauma Rehabilitation*, 15(5), 1092-102.

PMID #: 10970930

ABSTRACT: We have recently reported the results of a prospective controlled randomized trial comparing home versus inpatient cognitive rehabilitation for patients with moderate to severe head injury. That study showed no overall difference in outcomes between the two groups. In this article, we provide further details of the home program arm of the study. All patients in the home program received medical treatment as needed, a multidisciplinary in-hospital evaluation, and TBI counseling before entering the eight-week home program, which then included guidance on home activities, as well as weekly telephone calls from a psychiatric nurse.

Gourlay, D., Lun, K.C., Lee, Y.N., & Tay, J. (2000). **Virtual reality for relearning daily living skills.** *International Journal of Medical Informatics*, 60(3), 255-61.

PMID #: 11137470

ABSTRACT: The explosive increase in the power of computers has enabled the creation of fast, interactive 3D environments, sometimes called virtual reality (VR). This technology, often associated with arcade games, is increasingly being used for more serious applications. This paper describes research showing transfer of skills from a virtual environment to the real world. We then describe our VR authoring tool and an application to help

cognitively impaired individuals relearn important daily living skills. Additionally we describe the development of a prototype networked system to enable a doctor to monitor remotely the rehabilitation of a group of patients.

McPherson, K.M., McNaughton, H., & Pentland, B. (2000). **Information needs of families when one member has a severe brain injury.** *International Journal of Rehabilitation Research*, 23(4), 295-301.

PMID #: 11192565

ABSTRACT: Despite calls for health and social services to respond to the needs of informal care givers, there is little evidence to guide practitioners in the best way to provide support and/or information in situations of complex need such as brain injury. This study addressed such an intervention in a prospective descriptive study, using both qualitative and quantitative methodology. Eighty-nine patients who had been admitted to a regional neuro-rehabilitation unit for management of traumatic or haemorrhagic brain injuries were consecutively discharged to the community over a period of 12 months. Eighty-two of these people identified a care giver who agreed to be interviewed at approximately six weeks after discharge regarding their concerns. The study identified that even soon after discharge from inpatient rehabilitation, care givers wanted more information. In many cases the need for information was unrelated to either the severity of injury or level of functional deficit. In addition, requests for information were in many cases not sought spontaneously, but required prompting. Such findings have implications if interventions in this field are to have the optimum chance of succeeding in providing support and assistance.

1999

Carlson, P., Davies, D., Harrick, L., Johnston, J., McColl, M.A., Minnes, P., & Shue, K. (1999). **Transitions to independent living after ABI.** *Brain Injury*, 13(5), 311-30.

PMID #: 10367143

ABSTRACT: One of the most challenging questions facing service providers and policy makers alike is the appropriate level of supervision for adults living in the community following a brain injury. In a three-year province-wide study of people entering the community following brain injury rehabilitation, four individuals (out of 22 studied) made a transition from fully supervised living to lower levels of formal supervision during their first year in the community. The present study seeks to provide more information about these four individuals, the factors that allowed them to move to lower levels of supervision, and the perceived success of that transition. For each partici-

part, the interviews conducted over the one year period in the initial study were reviewed in detail for information about independent living. In addition, each participant was interviewed again for this study, along with his significant other and three of the community program staff who were most closely involved with his transition. To summarize, factors most salient in the success of transition included: (1) Roles and relationships of family and program personnel; (2) staying away from drugs and alcohol; (3) availability of structured daily activities, including productive activity or community program; (4) financial management; and (5) emotion and behavior self-control. Secondary themes related to successful community living also included the availability of transportation and prior experience with community living since the onset of brain injury. These results offer the experience of four individuals in moving towards independent living. As such, they provide a starting point for further discussions of the process of supporting individuals to pursue the ultimate goal of independent living.

Karlovits, T., & McColl, M.A. (1999). **Coping with community reintegration after severe brain injury: A description of stresses and coping strategies.** *Brain Injury*, 13(11), 845-61.

PMID #: 10579657

ABSTRACT: A basic qualitative approach was used to describe the stresses and coping strategies of 11 adults with severe brain injury during a critical period of reintegrating into a new community. Subjects identified nine problems as stressful. The stresses conform to a theoretical model of community integration, consisting of four factors: social support, independent living, occupation, and a general integration factor. These stresses identified by subjects may be used in the development of a new measure of stress for persons with brain injury. Subjects used eight coping strategies to deal with these stresses. The coping strategies represent a sampling of three major types of coping: problem-focused, perception-focused, and emotion-focused. The findings show that subjects made more use of problem-focused coping strategies than any other type of coping, suggesting that persons with brain injury have awareness of the problems they face and the ability to assert some control over eliminating or managing these problems. The stresses and coping strategies are consistent with existing studies involving persons with brain injury. However, significant differences in some coping strategies reported in this study change how some forms of coping are thought about. The findings delineate the need for professionals to assist persons with brain injury develop more positive, adaptive coping strategies.

1998

Barnes, M.P., Semlyen, J.K., & Summers, S.J. (1998). **Traumatic brain injury: Efficacy of multidisciplinary rehabilitation.** *Archives of Physical Medicine and Rehabilitation*, 79(6), 678-83.

PMID #: 9630149

ABSTRACT: OBJECTIVE: To establish efficacy of a coordinated multidisciplinary rehabilitation service for severe head injury, provided at Hunters Moor Regional Rehabilitation Centre. DESIGN: A quasi-experimental design to compare treatment effects between two groups. The first group received a coordinated, multidisciplinary regional rehabilitation service; the other, a single discipline approach provided by local, district hospitals. Follow-up was for two years post-injury. PATIENTS OR OTHER PARTICIPANTS: Fifty-six consecutive severe head injury admissions, with an identified main caregiver, referred for rehabilitation within four weeks of their injury. MAIN OUTCOME MEASURES: The Barthel Index, the Functional Independence Measure, and the Newcastle Independence Assessment Form, a newly developed, real-life, comprehensive measure. In addition, caregivers completed the General Health Questionnaire. RESULTS: The group that received coordinated multidisciplinary rehabilitation not only demonstrated significant gains throughout the study period but also maintained treatment effect after input ended. Furthermore, caregivers of this group had significantly reduced levels of distress. The comparison group, despite initial lower injury severity and shorter hospital stay, did not demonstrate equivalent gains or any post-treatment effect. CONCLUSIONS: The results show the efficacy of a comprehensive, specialist multidisciplinary regional service. There are significant implications for service provision for people with severe traumatic head injury.

Carlson, P., Davies, D., Johnston, J., Karlovits, T., McColl, M.A., Minnes, P., & Shue, K. (1998). **The definition of community integration: Perspectives of people with brain injuries.** *Brain Injury*, 12(1), 15-30.

PMID #: 9483334

ABSTRACT: Despite considerable attention to community integration and related topics in the past decades, a clear definition of community integration continues to elude researchers and service providers. Common to most discussions of the topic, however, are three ideas: (1) that integration involves relationships with others, (2) independence in one's living situation, (3) and activities to fill one's time. The present study sought to expand this conceptualization of community integration by asking people with brain injuries for their own perspectives on

community integration. This qualitative study resulted in a definition of community integration consisting of nine indicators: orientation, acceptance, conformity, close and diffuse relationships, living situation, independence, productivity, and leisure. These indicators were empirically derived from the text of 116 interviews with people with moderate-severe brain injuries living in the community. Eighteen adults living in supported living programs were followed for one year, to track their evolving definition of integration and the factors they felt were related to integration. The study also showed a general trend toward more positive evaluation over the year, and revealed that positive evaluation was frequently related to meeting new people and freedom from staff supervision. These findings are interpreted in the light of recommendations for community programs.

Carlson, P., Harrick, L., Johnston, J., & Minnes, P. (1998). **A transitional living environment for persons with brain injuries: Staff and client perceptions.** *Brain Injury*, 12(11), 987-92.

PMID #: 9839031

ABSTRACT: Given increasing interest in social ecology and the impact of environmental factors upon rehabilitation outcomes, the purpose of this study was to begin to document the characteristics of a particular environment designed to meet the needs of persons with traumatic brain injuries. Staff and clients at the Transitional Living Centre of Kingston, Ontario (TLC), a community based post-acute rehabilitation program providing both residential and day programs for adults who have acquired brain injuries participated in this study by completing the Community-Oriented Program Environment Scale (COPES). While COPES subscale scores for clients and staff were within the average range, the results of a multivariate analysis of variance indicated that client and staff perceptions of the TLC environment differed significantly on two subscales within the Personal Development Dimension (i.e., Personal Problem orientation, Anger and Aggression) and on one subscale under the System Maintenance Dimension (i.e., Staff Control). The results of this study suggest that future research should consider the impact of staff and client perceptions on the effectiveness of the therapeutic environment of brain injury programs.

Brain Injury Related Clinical and Rehabilitation Trials



Two excellent resources on current brain injury research are ClinicalTrials.gov (www.clinicaltrials.gov) and RehabTrials.org (www.rehabtrials.org). A service of the US National Institutes of Health and developed by the National Library of Medicine Clinical Trials provides regularly updated information about federally and privately supported clinical research that includes human volunteers. The trials at Clinicaltrials.gov range from pharmaceutical testing to medical interventions to physical and occupational therapy methods. They may focus on chronic conditions, new injuries, or preventative measures. By contrast, Rehabtrials.org focuses on treatment following injury or diagnosis. Rehabtrials.org also includes pharmaceutical, therapeutic, and medical research; it is the product of the Kessler Medical Rehabilitation Research and Education Center.

We performed several searches of the ClinicalTrials.gov and found the following study results (at various stages):

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Brain Injury and Community	9
Brain Injury and Community Living	4
Brain Injury and Community Integration	2
Brain Injury	216
TBI	98
ABI	153

We also searched Rehabtrials.org and found 8 trials that were all currently recruiting. *For more information visit www.rehabtrials.org/trials.*

The following are the two studies listed on ClinicalTrial.gov for brain injury and community integration:

Affect Recognition: Enhancing Performance of Persons With Traumatic Brain Injury

Status: Recruiting

ClinicalTrials.gov Identifier: NCT00283153

Expressive Arts as a Social and Community Integration Tool for Youth Recovering From Brain Injury

Status: Not yet recruiting

ClinicalTrials.gov Identifier: NCT00434603

For more information please visit www.clinicaltrials.gov and use the above search terms and/or search by the Clinical Trials Identifier.

Quick Looks



Brain Injury Association of America (BIAA)

Toll Free Family Helpline: 800/444-6443

Email: FamilyHelpLine@biausa.org

www.biausa.org

Brain Injury Resource Center

Phone: 206/621-8558

Email: brain@headinjury.com

www.headinjury.com

Brain Trauma Foundation

Phone: 212/772-0608

www.braintrauma.org

Centre for Neuro Skills TBI Resource Guide

Toll Free: 800/922-4994

www.neuroskills.com

Family Village — Brain Injury Information

A Global Community of Disability-Related Resources

www.familyvillage.wisc.edu/lib_brin.htm

International Brain Injury Association

Phone: 703/960-6500

Email: mjroberts@aol.com

www.internationalbrain.org

National Resource Center for Traumatic Brain Injury

www.neuro.pmr.vcu.edu

TBI Home and Brain Injury Chat

TBI Home and Brain Injury Chat are a peer support websites for people living with brain injury, their families and friends to support each other by sharing their experiences.

tbichat.org

Traumatic Brain Injury Survival Guide

Phone: 231/935-0388


















































Email: debglenn@yahoo.com

www.tbiguide.com

Yahoo Groups (270) related to "brain injury"

groups.yahoo.com/search?query=brain+injury









Search Terms for Brain Injury and Community Integration

- | | |
|--|---|
|  Accidents |  Home-Based Care/Services |
|  Activities of Daily Living (ADLS) |  Hypoxia of the brain |
|  Adjustment |  Inclusion |
|  Advocacy |  Independent Living |
|  Attitudinal Barriers |  Injury Severity Score |
|  Behavior Modeling/Modification/Therapy |  Interpersonal Relations |
|  Brain Damage |  Intervention |
|  Brain Injuries |  Living Facilities |
| - Classification |  Long Term Care |
| - Complications |  Mainstreaming |
| - Diagnosis |  Model Programs |
| - Epidemiology |  Needs Assessment |
| - Physiopathology |  Outcome Assessment |
| - Psychology |  Program Development/Evaluation |
| - Rehabilitation |  Psychosocial Aspects/Factors |
|  Caregivers |  Quality of Life |
|  Client Characteristics/Satisfaction |  Recovery of Function |
|  Clinical Management |  Recreation |
|  Cognition |  Rehabilitation Centers/Methods/Organizations |
|  Cognitive Rehabilitation/Therapy |  Research |
|  Community-Based Services |  Residential Facilities/Living/Treatment |
|  Community Living/Resources |  Self Assessment |
|  Disability Evaluation/Management |  Service Delivery/Integration/Utilization |
|  Disabled Persons Attitudes |  Social Behavior/Environment/Services/Skills/Support |
|  Evaluation/Studies/Techniques |  Socialization |
|  Functional Evaluation/Status |  Therapy/Psychological/Physical |
|  Glasgow Coma Scale |  Vocational Rehabilitation |
|  Head Injuries/Acquired/Closed/Opened/Traumatic | |
|  Health Education | |

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