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Literature search results

Search completed for: 

Search required by: ASAP

Search completed on: 3rd March 2015

Search completed by: Richard Bridgen

Search details

Patient with severe brain injury and with residual physical, or communication, emotional or cognitive impairments. Use of hyperbaric oxygen or standard rehabilitation including occupational therapy and physiotherapy in improving function.

Resources searched

NICE Evidence; TRIP Database; Cochrane Library; CINAHL; EMBASE; MEDLINE; Google Scholar

Database search terms: (severe OR acute OR critical OR serious OR serious OR grave OR traumatic) adj2 brain adj2 (injur* OR wound* OR trauma*); exp BRAIN INJURIES; residual* adj2 (physic* OR emotion* OR communic*); resid* adj2 function*; cognitiv* adj2 (disorder* OR impair* OR damage*); (emotion* OR physic* OR communic*) adj2 (impair* OR disorder* OR damage*); exp COGNITION DISORDERS; hyperbaric* adj2 oxygen*; exp HYPERBARIC OXYGENATION; rehab*; exp PHYSICAL AND REHABILITATION MEDICINE; exp REHABILITATION; “occupational therap*”; exp OCCUPATIONAL THERAPY; exp PHYSICAL THERAPY MODALITIES; physiotherapy*; “physical therap*”; improve* adj2 function*

Evidence / Google Scholar search string(s): “severe brain injury” (”hyperbaric oxygen” OR “hyperbaric oxygenation” OR rehabilitation OR “occupational therapy” OR physiotherapy) (“cognitive impairment” OR “emotional impairment” OR “physical impairment” OR “communication impairment”)

“severe brain injury” (”hyperbaric oxygen” OR “hyperbaric oxygenation” OR rehabilitation OR “occupational therapy” OR physiotherapy)

“severe brain injury” (”hyperbaric oxygen” OR “hyperbaric oxygenation”) (rehabilitation OR “occupational therapy” OR physiotherapy)
### Summary

There is some evidence for this topic, but most covers either hyperbaric oxygenation or rehabilitation, not both. There are a couple of studies you may find useful: 3; and possibly some of the Google Scholar results. The reference lists for study 3 may also prove useful. I have also included studies covering one intervention or the other in case these outcomes shed light on your quest.

### Guidelines and Policy

**NICE Pathways**

Head injury 2015

**SIGN**

Guideline 130 Brain injury rehabilitation in adults 2013

1. In the chronic phase (ie >1 month post injury) there is evidence to support the use of bromocriptine and levodopa for patients in the vegetative state, amitriptyline, hyperbaric oxygen and amantadine for patients in the MCS and hyperbaric oxygen for patients in prolonged coma.

2. For optimal outcomes, higher intensity rehabilitation featuring early intervention should be delivered by specialist multidisciplinary teams.

3. An RCT of 68 patients with moderate to severe brain injuries showed that a group receiving a comprehensive, holistic programme of neuropsychological rehabilitation in a community setting demonstrated greater improvement in the community integration questionnaire and the perceived quality of life scale than a group receiving standard rehabilitation in the same setting.

Where further rehabilitation is indicated for patients with brain injury who are discharged from inpatient care, it may be offered by telephone or face-to-face methods to alleviate long term burdens due to depression, behavioural and cognitive consequences.

### Evidence Reviews

**AHRQ**

Multidisciplinary Postacute Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults 2012

The body of evidence is not informative regarding effectiveness or comparative effectiveness of multidisciplinary postacute rehabilitation. Further research should address methodological flaws common in these studies and further address effectiveness research questions.

**Cochrane Database of Systematic Reviews**

Hyperbaric oxygen therapy for the adjunctive treatment of traumatic brain injury 2012

In people with traumatic brain injury, while the addition of HBOT may reduce the risk of death and improve the final GCS, there is little evidence that the survivors have a good outcome. The improvement of 2.68 points in GCS is difficult to interpret. This scale runs from three (deeply comatose and unresponsive) to 15 (fully conscious), and the clinical importance of an improvement of approximately three points will vary dramatically with the starting value (for example an improvement from 12 to 15 would represent an important clinical benefit, but an improvement from three to six would leave the patient with severe
and highly dependent impairment). The routine application of HBOT to these patients cannot be justified from this review. Given the modest number of patients, methodological shortcomings of included trials and poor reporting, the results should be interpreted cautiously. An appropriately powered trial of high methodological rigour is required to define which patients, if any, can be expected to benefit most from HBOT.

Published Research – Databases

1. Executive function and coping in stroke survivors.

Author(s) Kegel J, Dux M, Macko R

Citation: Neurorehabilitation, 2014, vol./is. 34/1(55-63), 1053-8135;1878-6448 (2014)

Publication Date: 2014

Abstract: BACKGROUND: Stroke is a leading cause of disability and sequelae may include physical, emotional, and cognitive impairments. The methods employed to cope with distress, both emotional and cognitive, have not been evaluated in individuals post-stroke. However, research in traumatic brain injury (TBI) suggests that executive function is positively correlated with adaptive coping and negatively correlated with maladaptive coping strategies (Krpan et al., 2007). Examination of these constructs post-stroke may assist with enriching our understanding of cognitive and emotional symptomatology and optimize rehabilitation strategies.OBJECTIVE: The present study aimed to assess the association between executive function and coping strategies in a sample of chronic stroke survivors. The researchers hypothesized that executive function would be positively correlated with adaptive coping strategies and negatively correlated with maladaptive coping strategies.METHODS: Fifteen stroke survivors were administered a battery of cognitive tests assessing executive function and also completed the Ways of Coping Questionnaire (WAYS), a self-report coping measure.RESULTS: Analyses indicated that executive function deficits were related to increased avoidant coping. Contrary to expectations, executive function was not significantly related to active coping. In addition, post hoc analyses revealed that executive function was a significant predictor of avoidant coping after controlling for demographics.CONCLUSIONS: Our data, in accordance with prior work in TBI, suggests that executive function and aspects of coping are associated. Rehabilitation strategies that improve executive function may also lead to utilization of adaptive coping strategies. Research has shown that aerobic exercise increases activation in the frontal lobe and improves executive function (Colcombe & Kramer, 2003; Colcombe et al., 2004). Future studies should examine whether aerobic exercise positively affects executive function and coping in stroke survivors.

Source: Medline
Available in fulltext from NeuroRehabilitation at EBSCOhost

2. Back home after an acquired brain injury: Building a 'low-cost' team to provide theory-driven cognitive rehabilitation after routine interventions.

Author(s) Pierini, Davide, Hoerold, Doreen

Citation: NeuroRehabilitation, 01 January 2014, vol./is. 34/1(65-80), 10538135

Publication Date: 01 January 2014

Abstract: BACKGROUND: Individuals with Acquired Brain Injury (ABI) could benefit from further cognitive rehabilitation, after they have returned home. However, a lack of specialist services to provide such rehabilitation often prevents this. This leads to reduced reintegration of patients, increased social disadvantages and ultimately, higher economic costs. METHOD: 10 months post-stroke, a 69 year-old woman was discharged from an inpatient rehabilitation program and returned home with severe cognitive impairments. We describe a pilot project which provided an individualised, low cost rehabilitation program, supervised and trained by a neuropsychologist. Progress was monitored every 3 months in
order to decide on continuation of the program, based on the achieved results and predicted costs. RESULTS: Post intervention, despite severe initial impairment, cognitive and most notably daily functioning had improved. Although the financial investment was moderately high for the family, the intervention was still considered cost-effective when compared with the required costs of care in a local non-specialist care home. Moreover, the pilot experience was used to build a 'local expert team' available for other individuals requiring rehabilitation. CONCLUSIONS: These results encourage the development of similar local 'low cost' teams in the community, to provide scientifically-grounded cognitive rehabilitation for ABI patients returning home.

Source: CINAHL
Available in fulltext from NeuroRehabilitation at EBSCOhost
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Available in fulltext from NeuroRehabilitation at EBSCOhost

3. Three-year follow-up on SPECT brain scan in evaluation of traumatic brain injury (TBI), post-traumatic stress disorder (PTSD) and cognitive defect post-surgery

Author(s) Maxfield W.S., Cralle R.H.

Citation: Clinical Nuclear Medicine, September 2013, vol./is. 38/9(762-763), 0363-9762 (September 2013)

Publication Date: September 2013

Abstract: BACKGROUND: We thought a three-year follow-up on the patients presented in 2010 Clinical Nuclear Medicine 35:659, August, 2010 might be of interest. The majority of patients presented had SPECT brain scans, which demonstrated brain injury and then follow-up SPECT brain scan, which objectively documented response to hyperbaric oxygen therapy and aggressive physical therapy. FOLLOW-UP: Two of the veterans that we treated showed significant clinical improvement, but follow-up contact has been lost. R.B. did well with hyperbaric oxygen, but shortly thereafter his daughter was killed in a motor vehicle accident and the patient regressed, as we understand, into drug use. A.B. did well with hyperbaric oxygen therapy, markedly improving in his ability to walk and maneuver. We have lost contact with that patient also, but second-hand data has indicated that he is continuing to do well. W.H., the patient that developed significant cognitive defect after a prolonged cardiovascular procedure, initially responded well to hyperbaric oxygen, but then had some regression and has, again, been lost to contact with us. J.R., the veteran with only 40 blast exposures and no physical injury, who responded very well to hyperbaric oxygen, has continued to do well. He is off of all medications and has been an honor student in college. His mother has repeatedly told us, "Thanks for giving me back my son". A.M., the young man who had a severe traumatic brain injury and initially was totally bed confined, has had hyperbaric oxygen and aggressive physical therapy since his injury 11 years ago and has continued to improve. In the interim, from 2010, he received 20 hyperbaric oxygen therapy treatments plus physical therapy treatment three times per year. He was last evaluated in November 2012, at which time he had developed ability to move his left arm and to manipulate his left hand, even picking up marbles with his left hand. His most recent SPECT brain scan on November 15, 2012 showed continued improvement in the pattern of marked abnormality, predominantly in the right cerebral hemisphere, which would correlate with his regaining ability to use his left arm and hand after having had no function in that extremity for 11 years as a result of his TBI. His plan is to continue treatment three times per year. The young lady with a traumatic brain injury from horseback riding whose neurologist had suggested that her feeding tube be removed as she would never recover, showed significant improvement with the hyperbaric oxygen therapy and graduated from high school. She did well until three years after the hyperbaric oxygen therapy when she had surgery to reconstruct her skull. Post-surgery she had a severe seizure and has had to continue to take anti-seizure medication. She has had some additional hyperbaric oxygen therapy and had one episode of toxicity to oxygen, which is very unusual. The family is considering additional hyperbaric oxygen in the future. CONCLUSIONS: We have not been able to have full follow-up on all of the patients that we treated. Half of the patients have shown very excellent long-term improvement with the hyperbaric oxygen that was given initially. A.M., who has continued with hyperbaric oxygen, has now regained, after 11 years of paralysis, use of his left arm. His recent SPECT brain
scan on November 15, 2012 confirms the further improvement in the brain area with the continued treatment. The three-year follow-up on these patients provides additional indication that SPECT brain scan should be obtained on patients with traumatic brain injury, PTSD and cognitive defects post-surgery to demonstrate the initial damage to the brain and objectively document response to treatment.

Source: EMBASE

4. Cognitive-communication recovery during post-traumatic amnesia (PTA): A case study

Author(s) Steel J., Ferguson A., Spencer E., Togher L.

Citation: Brain Impairment, May 2013, vol./is. 14/1(177), 1443-9646 (May 2013)

Publication Date: May 2013

Abstract: Background and aims: Formal speech pathology assessment of cognitive communication after traumatic brain injury (TBI) generally commences once post-traumatic amnesia (PTA) has resolved. Many speech pathologists are highly involved with informal communication assessment during PTA (Steel, Ferguson, Spencer, & Togher, 2012), although the purpose of monitoring communication and the predictive value of findings are unclear. The current study sought to describe cognitive-communication impairments throughout PTA and at three months after PTA emergence. The resolution of communication impairments during PTA has not previously been systematically documented, and little is known about early recovery of cognitive-communication. Method: This descriptive case study documents the resolution of communication impairments of a 47 year old male with severe TBI, with PTA duration of ten weeks. Repeated systematic sampling of communication took place on nine occasions over the course of 4 weeks during PTA, and once at three months afterwards. Measures were derived from discourse analysis, nature of performance on language and cognitive-linguistic tasks, and global ratings of social communication from the perspective of the rehabilitation team and family. Results: Improvement in function was observed across all domains of communication over the course of PTA. Some communication impairments observed during PTA persisted three months later and required ongoing intervention. The relationship between the communication profile during PTA and at three months afterwards will be discussed. Conclusions: Preliminary results indicate that observations of cognitive-communication recovery during PTA can make a valuable contribution to evaluation of PTA status and may provide an additional indicator of return of cognitive function. Further research is warranted into the nature of cognitive communication recovery in the early stages after injury.

Source: EMBASE

5. Low-cost evaluation and real-time feedback of static and dynamic weight bearing asymmetry in patients undergoing in-patient physiotherapy rehabilitation for neurological conditions

Author(s) Foo J., Paterson K., Williams G., Clark R.

Citation: Journal of NeuroEngineering and Rehabilitation, 2013, vol./is. 10/1, 1743-0003 (2013)

Publication Date: 2013

Abstract: Background: Weight bearing asymmetry is common in patients with neurological conditions, and recent advances in gaming technology have produced force platforms that are suitable for use in a clinical setting. The aim of this research is to determine whether commercially-available Wii Balance Boards with customized software providing real-time feedback could be used in a clinical setting to evaluate and improve weight-bearing asymmetry in people with various neurological conditions. Methods. Twenty participants (age = 43.25 +/- 19.37 years) receiving physiotherapy as a result of a neurological condition performed three trials each of two tasks (static standing and sit-to-stand) with and without visual feedback. Vertical forces were measured using available Wii Balance Boards coupled with customized software that displayed visual feedback in real-time. Primary outcome measures included weight-bearing asymmetry as a percentage of body mass, peak force symmetry index, and a visual analogue scale score rating self-perceived level of
asymmetry. Results: Weight-bearing asymmetry during the static balance task was significantly reduced ($Z = -2.912, p = 0.004, ES = 0.65$) with visual feedback. There was no significant difference ($Z = -0.336, p = 0.737$) with visual feedback for the dynamic task, however subgroup analysis indicated that those with higher weight-bearing asymmetry responded the most to feedback. Correlation analysis revealed little or no relationship between participant perception of weight-bearing asymmetry and the results for the static or dynamic balance task (Spearman's rho: $= 0.138, p = 0.561$ and $= 0.018, = 0.940$ respectively). Conclusions: These findings suggest that weight-bearing asymmetry can be reduced during static tasks in patients with neurological conditions using inexpensive commercially-available Wii Balance Boards coupled with customized visual feedback software. Further research is needed to determine whether real-time visual feedback is appropriate for reducing dynamic weight-bearing asymmetry, whether improvements result in improved physical function, and how cognitive and physical impairments influence the patient's ability to respond to treatment. © 2013 Foo et al.; licensee BioMed Central Ltd.

Source: EMBASE

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Available in fulltext from Journal of NeuroEngineering and Rehabilitation at National Library of Medicine


Author(s) Watanabe S

Citation: Work, 2013, vol./is. 45/2(273-7), 1051-9815;1875-9270 (2013)

Publication Date: 2013

Abstract: OBJECTIVE: To report on functional outcomes of clients with traumatic brain injury (TBI) admitted to a sub-acute rehabilitation hospital and rehabilitation facility in Japan.PARTICIPANTS: The subjects included 300 adults with TBI who underwent a rehabilitation in-patient program at the hospital at the Kanagawa Rehabilitation Center.METHODS: Individual and group programs were designed for TBI clients using an interdisciplinary teamwork model including supported employment. All clients were evaluated by the Barthel Index, WAIS-R, and social outcome.RESULTS: Overall, at discharge from the hospital, 46.4% of 300 clients were placed in gainful employment or returned to the school they had attended previously.CONCLUSIONS: Despite a high prevalence of cognitive and behavioral disorders after moderate-to-severe TBI, long-term functional improvement is likely to occur in clients with TBI. Greater gains in both physical and cognitive functions are made through a multidisciplinary, wide-ranging, comprehensive approach to rehabilitation.

Source: Medline

Available in fulltext from Work at EBSCOhost
7. Post-traumatic attention disorder in the chronic mild traumatic brain injury population: A case study using direct attention training and methylphenidate

**Author(s)** Cabrera J., Norman R.

**Citation:** Brain Injury, April 2012, vol./is. 26/4-5(577-578), 0269-9052 (April-May 2012)

**Publication Date:** April 2012

**Abstract:** Objectives: The purpose of this case study is to illustrate the effects of of direct attention training and pharmacological treatment on symptoms of post-traumatic attention disorder in the late stages of recovery from mild traumatic brain injury (mTBI). Methods: A.M., a thirty-two year old Hispanic male with medical history significant for 2 mTBI events, presented to a Veterans Affairs Polytrauma Support Clinic Team (PSCT) for management of postconcussive symptoms after medical retirement from the Army. Chief complaints during initial Polytrauma visit included headaches, chronic pain and impaired cognition. Cognitive symptoms were assessed using the Test of Everyday Attention (TEA) and self-reported measures of attention, including the Neurobehavioral Symptom Inventory (NSI) and the Attention Rating and Monitoring Scale (ARMS). Results of standardized testing indicated deficits in visual, selective and sustained attention and processing speed. Subjective measures revealed difficulties with driving, maintaining conversations and concentrating while completing college course work. A.M's treatment plan included seven encounters with a speech-language pathologist (SLP) for direct attention training, seven encounters with social work, six encounters with physical therapy, three encounters with a behavioral health provider and five encounters with a medical provider. Methylphenidate was initiated following first treatment session with SLP. Results: Repeated outcome measures following the treatment plan demonstrated improved sustained, selective and visual attention. Additionally, A.M. reported improved daily functioning. Conclusions: Attention deficits and associated complaints with memory and executive function are common sequelae following mTBI. Functional limitations in these areas can contribute to reduced community participation and return to work. The present case study suggest positive gains in functional attention skills following direct attention training and neurostimulant therapy, in combination with an interdisciplinary treatment plan. The individual in this case study showed marked improvement in objective measures of attention which generalized to daily tasks.

**Source:** EMBASE

Available in fulltext from Brain Injury at EBSCOhost

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8. Interdisciplinary rehabilitation of mild TBI and PTSD: A case report

**Author(s)** Ryan P.B., Lee-Wilk T., Kok B.C., Wilk J.E.

**Citation:** Brain Injury, September 2011, vol./is. 25/10(1019-1025), 0269-9052;1362-301X (September 2011)

**Publication Date:** September 2011

**Abstract:** Background: Prevalence of mild traumatic brain injury (mTBI) or concussion on the battlefield in Iraq/Afghanistan has resulted in its designation as a ‘signature injury’. Civilian studies have shown that negative expectations for recovery may lead to worse outcomes. While there is concern that concussion screening procedures in the Veteran's Affairs Healthcare System and the Department of Defence could fuel negative expectations, leading to negative iatrogenic effects, it has been difficult to document this in clinical settings. The aim of this report is to describe the case of a veteran with comorbid mTBI/PTSD with persistent symptoms of unknown aetiology and the effects of provider communications on the patient's recovery. Methods: Case report of a veteran with reported mTBI, including provider communications, neuropsychological test results and report of functioning after changes in provider messages. Results: Two-years post-mTBI, the patient attributed cognitive difficulties to his brain injury, but neuropsychological assessment found that his cognitive profile was consistent with psychological rather than neurological dysfunction. After providers systematically emphasized expectations of recovery, the patient's daily functioning improved. Conclusions: This case illustrates difficulties in mass
screening for and treating mTBI. Recommendations for improvement include clinician training in effectively communicating positive expectations of recovery after concussion.

Source: EMBASE
Available in fulltext from Brain Injury at EBSCOhost
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Author(s) McFadden KL, Healy KM, Dettmann ML, Kaye JT, Ito TA, Hernandez TD
Citation: Journal of Neurotrauma, January 2011, vol./is. 28/1(21-34), 0897-7151;1557-9042 (2011 Jan)
Publication Date: January 2011
Abstract: Acupressure is a complementary and alternative medicine (CAM) treatment using fingertips to stimulate acupoints on the skin. Although suggested to improve cognitive function, acupressure has not been previously investigated with a controlled design in traumatic brain injury (TBI) survivors, who could particularly benefit from a non-pharmacological intervention for cognitive impairment. A randomized, placebo-controlled, single-blind design assessed the effects of acupressure (eight treatments over 4 weeks) on cognitive impairment and state of being following TBI, including assessment of event-related potentials (ERPs) during Stroop and auditory oddball tasks. It was hypothesized that active acupressure treatments would confer greater cognitive improvement than placebo treatments, perhaps because of enhanced relaxation response induction and resulting stress reduction. Significant treatment effects were found comparing pre- to post-treatment change between groups. During the Stroop task, the active-treatment group showed greater reduction in both P300 latency ($p=0.010$, partial 2=0.26) and amplitude ($p=0.011$, partial 2=0.26), as well as a reduced Stroop effect on accuracy ($p=0.008$, partial 2=0.21) than did the placebo group. Additionally, the active-treatment group improved more than did the placebo group on the digit span test ($p=0.043$, Cohen's $d=0.68$). Together, these results suggest an enhancement in working memory function associated with active treatments. Because acupressure emphasizes self-care and can be taught to novice individuals, it warrants further study as an adjunct treatment for TBI.

Source: Medline


Author(s) Cullen NK, Weisz K
Citation: Brain Injury, 2011, vol./is. 25/1(35-43), 0269-9052;1362-301X (2011)
Publication Date: 2011
Abstract: OBJECTIVES: To assess the effectiveness of inpatient rehabilitation in adults who have sustained an anoxic brain injury (AnBI). Secondly, to identify areas of cognition that predict functional outcomes at discharge.DESIGN: Retrospective, matched case-controlled study.METHODS: Ten patients with moderate-to-severe AnBI and 10 patients with traumatic brain injury (TBI), treated in an inpatient neurorehabilitation programme, were matched on age, acute care length of stay and admission Functional Independence Measure (FIM). Functional outcome was assessed using the FIM and Disability Rating Scale (DRS).RESULTS: Patients with AnBI performed worse on all measures of functional outcome relative to patients with TBI. Patients with AnBI achieved significantly lower FIM motor and cognitive gain compared with patients with TBI ($11.5$, SD $13.6$ vs. $31.0$, SD $19.7$ and $2.4$, SD $3.9$ vs. $7.5$, SD $4.2$, respectively ($p<0.02$)). DRS data showed similar trends of functional improvement between the groups. Several neuropsychometric tests correlated with functional outcome ($p<0.01$).CONCLUSIONS: Patients with AnBI had worse functional outcomes following rehabilitation than patients with TBI, confirming the results of previous reports. Poor cognitive function predicted poor functional outcomes on the FIM and somewhat on the DRS. Research is needed to assess why these differences occur and to
improve or develop new effective rehabilitation treatments for AnBI.

Source: Medline
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Available in fulltext from Brain Injury at EBSCOhost

11. Application of medical gases in the field of neurobiology

Author(s): Liu W., Khatibi N., Sridharan A., Zhang J.H.
Citation: Medical Gas Research, 2011, vol./is. 1/1, 2045-9912 (2011)
Publication Date: 2011
Abstract: Medical gases are pharmaceutical molecules which offer solutions to a wide array of medical needs. This can range from use in burn and stroke victims to hypoxia therapy in children. More specifically however, gases such as oxygen, helium, xenon, and hydrogen have recently come under increased exploration for their potential therapeutic use with various brain disease states including hypoxia-ischemia, cerebral hemorrhages, and traumatic brain injuries. As a result, this article will review the various advances in medical gas research and discuss the potential therapeutic applications and mechanisms with regards to the field of neurobiology. © 2011 Liu et al; licensee BioMed Central Ltd.

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Available in fulltext from Medical Gas Research at Free Access Content


Author(s): Bergquist T, Gehl C, Mandrekar J, Lepore S, Hanna S, Osten A, Beaulieu W
Citation: Brain Injury, September 2009, vol./is. 23/10(790-9), 0269-9052;1362-301X (2009 Sep)
Publication Date: September 2009
Abstract: PRIMARY OBJECTIVE: The current study examined whether cognitive rehabilitation delivered over the Internet was associated with improvements in functioning.RESEARCH DESIGN: A total of 14 individuals with medically documented traumatic brain injury completed this study. Participants completed 30 sessions of an active calendar acquisition intervention and 30 sessions of a control diary intervention in a cross-over study design for a total of 60 online sessions. All sessions were completed using an instant messaging system via the Internet. Measures of cognitive functioning, ratings of memory and mood and frequency of use of common memory and cognitive compensation techniques were gathered from participants and family members.MAIN OUTCOMES AND RESULTS: There were no significant differences between the active and control conditions on the primary outcome measure of memory functioning. However, significant improvements in use of compensatory strategies as well as family reports of improved memory and mood were observed following completion of all sessions. Individuals with less use of compensatory strategies at baseline were significantly less likely to complete the study.CONCLUSIONS: These results suggest that the Internet may be an effective delivering mechanism for compensatory cognitive rehabilitation, particularly among individuals who are already utilizing some basic compensatory strategies.

Source: Medline
Available in fulltext from Brain Injury at EBSCOhost

Author(s) Cicerone KD, Mott T, Azulay J, Sharlow-Galella MA, Ellmo WJ, Paradise S, Friel JC

Citation: Archives of Physical Medicine & Rehabilitation, December 2008, vol./is. 89/12(2239-49), 0003-9993;1532-821X (2008 Dec)

Publication Date: December 2008

Abstract: OBJECTIVE: To evaluate the effectiveness of comprehensive, holistic neuropsychologic (NP) rehabilitation compared with standard, multidisciplinary rehabilitation for people with traumatic brain injury (TBI). DESIGN: Randomized practical controlled trial. SETTING: Postacute brain injury rehabilitation center within a suburban rehabilitation hospital. PARTICIPANTS: Participants with TBI were recruited from clinical referrals and referrals from the community. Sixty-eight participants who met inclusion criteria were randomly allocated to treatment conditions. Most participants (88%) had sustained moderate or severe TBI, and greater than half (57%) were more than 1 year postinjury at the beginning of treatment. INTERVENTIONS: Treatment was conducted 15 hours per week for 16 weeks. Standard neurorehabilitation consisted primarily of individual, discipline specific therapies (n=34). Intensive cognitive rehabilitation emphasized the integration of cognitive, interpersonal, and functional interventions within a therapeutic environment (n=34). MAIN OUTCOME MEASURES: Primary outcomes were the Community Integration Questionnaire (CIQ) and Perceived Quality of Life scale (PQOL). Secondary outcomes included NP functioning, perceived self-efficacy, and community-based employment. RESULTS: NP functioning improved in both conditions. Intensive cognitive rehabilitation participants showed greater improvements on the CIQ (effect size [ES]=0.59) and PQOL (ES=0.30) as well as improved self-efficacy for the management of symptoms (ES=0.26) compared with standard neurorehabilitation treatment. These gains were maintained at the 6-month follow-up. Standard neurorehabilitation participants showed improved productivity at the 6-month follow-up associated with the need for continued rehabilitation. CONCLUSIONS: Improvements seen after intensive cognitive rehabilitation may be related to interventions directed at the self-regulation of cognitive and emotional processes and the integrated treatment of cognitive, interpersonal, and functional skills. The results show the effectiveness of comprehensive holistic NP rehabilitation for improving community functioning and quality of life after TBI compared with standard rehabilitation.

Source: Medline


Author(s) Irdesel J, Aydiner SB, Akgoz S

Citation: Neurocirugia (Asturias, Spain), February 2007, vol./is. 18/1(5-15), 1130-1473;1130-1473 (2007 Feb)

Publication Date: February 2007

Abstract: Rehabilitation goals after traumatic brain injury are improving function, increasing the level of independence as high as possible, preventing complications and providing an acceptable environment to the patient. Several complications can be encountered during the rehabilitation period which lead to physical, cognitive and neurobehavioral impairments that cause major delay in functional improvement. This prospective study was designed in order to investigate the complications and their relations with functional recovery in patients that were included in the acute phase of a rehabilitation program. Thirty traumatic brain injured patients admitted to the Intensive Care Units of Uludag University School of Medicine were included in the study. Rehabilitation program consisted in appropriate positioning, range of motion exercises, postural drainage and respiratory exercises. Complications that were encountered during intensive care rehabilitation program were recorded. All patients were evaluated by Functional Independence Measure, Disability Rating Scale and Ranchos Los Amigos Levels of Cognitive Function Scale at admission and discharge. Improvement was observed in patients in terms of functional outcome and
disability levels. Pneumonia, atelectasis, anemia and meningitis were the most frequent complications. Deterioration in functional outcome and disability levels was noted as the number of these complications increased. In conclusion, rehabilitation has an important role in the management of traumatic brain injured patients. Reduction of frequency of complications and improvement in functional outcome and disability levels can be achieved through rehabilitation programs. Long-term controlled studies with large number of patients are needed in order to obtain accurate data on factors associated with rehabilitation outcomes.

Source: Medline
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Author(s) Demir SO, Altinok N, Aydin G, Koseoglu F
Citation: Brain Injury, December 2006, vol./is. 20/13-14(1383-90), 0269-9052;0269-9052 (2006 Dec)
Publication Date: December 2006
Abstract: OBJECTIVES: To investigate the relationship between language functions and cognitive and functional outcome and to evaluate the effects of a conventional language rehabilitation programme on aphasic adult patients in the post-acute stage of traumatic brain injury (TBI). DESIGN: Non-concurrent prospective study. Patients were assessed pre-treatment and post-treatment with standardized assessment tools. SUBJECTS: Sixty-one aphasic patients with TBI who were admitted to a rehabilitation centre in the post-acute phase for a late inpatient rehabilitation programme. METHODS: The motor sub-scales of the Functional Independence Measures and Disability Rating Scale were used to assess functional status and disability. Cognitive status was evaluated with the Mini-Mental Status Examination and the Functional Independence Measure cognitive sub-scale. The language function was evaluated with the Gulhane Aphasia Test. RESULTS: All functional, cognitive and language scores increased significantly during the rehabilitation programme. Language functions at admission were correlated with the Functional Independence Measure motor change scores and the Mini-Mental Status Examination change scores. Regression analyses revealed that auditory comprehension at admission was the most important independent determinant of functional and cognitive gain during rehabilitation. CONCLUSION: Post-acute language functions after late admission to a rehabilitation centre appear to be related to measures of cognitive and functional progress in patients with TBI. Functional and cognitive outcome is mainly affected by auditory comprehension. Results also showed the effectiveness of post-acute conventional rehabilitation in improving language functions.

Source: Medline
Available in fulltext from Brain Injury at EBSCOhost
Available in fulltext from Brain Injury at EBSCOhost


Author(s) Man DW, Soong WYL, Tam S, Hui-Chan CWY
Citation: Brain Injury, 01 August 2006, vol./is. 20/9(981-990), 02699052
Publication Date: 01 August 2006
Abstract: BACKGROUND: People with traumatic brain injury (TBI) must often deal with cognitive problems, including social problem-solving. The study reported herein evaluated the effectiveness of a newly developed pictorial-based analogical problem-solving skills training programme. It is hypothesized that the programme can help people with TBI to learn better problem-solving skills through systematic, theoretically driven learning strategies. METHOD: Based on the instrumental enrichment model and the hierarchy of daily problem-solving as suggested by Holloran and Bressler, analogical problem-solving training software was developed. Thirty subjects with TBI then attended a 20-session
interactive analogical problem-solving skills training programme. Another 20 subjects with TBI and of similar demographics formed the control group. The outcome measures included session-based quizzes on analogical problem-solving, the Category Test of the Halstead Reitan Test Battery (HRTB) and the Lawton IADL Scale. FINDINGS: The analogical problem-solving training strategies were found to be effective in improving problem-solving skills. The subjects generally demonstrated a selective improvement in their functional and overall problem-solving skills, but not in their basic problem-solving skills. The subjects in the control group showed stable problem-solving skills over a 4-week interval (no statistically significant changes). The findings indicated the therapeutic significance of the training programme. CONCLUSIONS: The results of the study suggested that innovative cognitive rehabilitation programmes can be customized to match the needs of clients with TBI. The applicability and implications of the interactive pictorial-based analogical problem-solving skill-training programme that was used in the study and possibilities for future study in this research area are also discussed.

Source: CINAHL
Available in fulltext from Brain Injury at EBSCOhost

17. Early versus later admission to postacute rehabilitation: Impact on functional outcome after traumatic brain injury

Author(s) High Jr. W.M., Roebuck-Spencer T., Sander A.M., Struchen M.A., Sherer M.

Citation: Archives of Physical Medicine and Rehabilitation, March 2006, vol./is. 87/3(334-342), 0003-9993 (March 2006)

Publication Date: March 2006

Abstract: Objective: To examine the impact of participation in a postacute community reentry program on functional outcome after traumatic brain injury (TBI). Design: Cohort, nonrandomized, intervention study. Pretest-posttest, follow-up design. Setting: Nonprofit outpatient community reentry program affiliated with an inpatient rehabilitation hospital. Participants: Three groups of persons with moderate to severe TBI differing in length of time between injury and admission. The first group entered postacute rehabilitation within 6 months of injury (n=115); the second group, between 6 and 12 months (n=23); and the third group, greater than 12 months (n=29). Interventions: Persons with TBI participated in a postacute community reentry program (average, 4.3mo) that 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. Main Outcome Measures: Disability Rating Scale, Supervision Rating Scale, and the Community Integration Questionnaire. Results: All groups showed improvements between admission and discharge on measures of overall disability, independence, home competency, and productivity, and these gains were maintained at follow-up. For the group beginning postacute rehabilitation the earliest (<6mo postinjury) independence continued to improve after discharge. Community integration total score and home competency also continued to improve even after discharge. Conclusions: The results point toward the effectiveness of postacute rehabilitation in improving functional outcome after TBI even for persons who have reached stable neurologic recovery at 12 or more months postinjury. ©2006 by the American Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation.

Source: EMBASE


Author(s) Tiersky LA, Anselmi V, Johnston MV, Kurtyka J, Roosen E, Schwartz T, Deluca J

Citation: Archives of Physical Medicine & Rehabilitation, August 2005, vol./is. 86/8(1565-74), 0003-9993:0003-9993 (2005 Aug)
Publication Date: August 2005

Abstract: OBJECTIVE: To test the effectiveness of a neuropsychologic rehabilitation program consisting of psychotherapy and cognitive remediation in the treatment of the affective and neuropsychologic sequelae of mild-spectrum traumatic brain injury (TBI). DESIGN: Single-blind randomized, wait-listed controlled trial, with repeated measures and multiple baselines. SETTING: Outpatient clinic in northern New Jersey. PARTICIPANTS: Twenty persons with persisting complaints after mild and moderate TBI (11 in treatment group, 9 controls). INTERVENTIONS: The experimental group received both 50 minutes of individual cognitive-behavioral psychotherapy and 50 minutes of individual cognitive remediation, 3 times a week for 11 weeks. The control group was wait-listed and received treatment after conclusion of follow-up. MAIN OUTCOME MEASURES: Symptom Check List-90R General Symptom Index, plus scales of depression, anxiety, coping, attention, and neuropsychologic functioning. RESULTS: Compared with the control group, the treatment group showed significantly improved emotional functioning, including lessened anxiety and depression. Most significant improvements in emotional distress were noted at 1 month and 3 months posttreatment. Performance on a measure of divided auditory attention also improved, but no changes were noted in community integration scores. CONCLUSIONS: Cognitive behavioral psychotherapy and cognitive remediation appear to diminish psychologic distress and improve cognitive functioning among community-living persons with mild and moderate TBI.

Source: Medline

19. Acute cognitive and neurobehavioural intervention for individuals with acquired brain injury: preliminary outcome data.

Author(s) Niemeier JP, Kreutzer JS, Taylor LA

Citation: Neuropsychological Rehabilitation, May 2005, vol./is. 15/2(129-46), 0960-2011:0960-2011 (2005 May)

Publication Date: May 2005

Abstract: The present study provides a rationale for and detailed description of a structured curriculum for a cognitive and neurobehavioural group intervention for patients in an acute inpatient brain injury rehabilitation setting. Preliminary outcome data are provided for 29 patients with acquired brain injuries who attended the group during inpatient rehabilitation. The group was held during three 30-minute sessions per week. Prior to discharge, patients completed a Learning Assessment, which assessed their level of knowledge about the material covered during the course. Patients received a mean score of 85.54 on the Learning Assessment. High scores on the Learning Assessment correlated significantly with discharge Disability Rating Scale total and Social Interaction FIM scores. Age, level of education, race, sex, and length of stay did not significantly impact these results. Results suggest that patients with acquired brain injuries benefit from acute cognitive and neurobehavioural intervention and are capable of learning compensatory strategies, even in the acute stages of recovery. This learning may help improve functional status, especially skills needed for psychosocial adjustment.

Source: Medline

20. Effects of categorization training in patients with TBI during postacute rehabilitation: preliminary findings.

Author(s) Constantinidou F, Thomas RD, Scharp VL, Laske KM, Hammerly MD, Guitonde S

Citation: Journal of Head Trauma Rehabilitation, March 2005, vol./is. 20/2(143-57), 0885-9701:0885-9701 (2005 Mar-Apr)

Publication Date: March 2005

Abstract: BACKGROUND: Previous research suggests that traumatic brain injury (TBI) interferes with the ability to extract and use attributes to describe objects. This study explored the effects of a systematic Categorization Program (CP) in participants with TBI and noninjured controls. PARTICIPANTS: Ten persons with moderate to severe TBI who...
received comprehensive postacute rehabilitation services and 13 matched noninjured controls participated in the study. INTERVENTION: All participants received CP training for 3 to 5 hours per week for 10 to 12 weeks that consisted of 8 levels and targeted concept formation, object categorization, and decision-making abilities. MAIN OUTCOME MEASURES: The Mayo-Portland Adaptability Inventory-3 (MPAI-3) and the Community Integration Questionnaire (CIQ). Two Categorization Tests (administered pretraining and posttraining) and 3 Probe Tasks (administered at specified intervals during training) assessed skills relating to categorization. RESULTS: Both groups showed significant improvement in categorization performance after the CP training on the 2 Categorization Tests related to the CP. They also were able to generalize and apply categorization and sorting skills in new situations (as measured by the Probe Tasks). Participants with TBI had improved functional outcome performance measured by the MPAI-3 and the CIQ. CONCLUSIONS: The systematic and hierarchical structure of the CP is beneficial to participants with TBI during postacute rehabilitation. This study contributes to the growing body of evidence supporting cognitive rehabilitation after moderate to severe TBI.

Source: Medline


Author(s) Cicerone KD, Mott T, Azulay J, Friel JC

Citation: Archives of Physical Medicine & Rehabilitation, 01 June 2004, vol./is. 85/6(943-950), 00039993

Publication Date: 01 June 2004

Abstract: OBJECTIVE: To evaluate the effectiveness of an intensive cognitive rehabilitation program (ICRP) compared with standard neurorehabilitation (SRP) for persons with traumatic brain injury (TBI). DESIGN: Nonrandomized controlled intervention trial. SETTING: Community-based, postacute outpatient brain injury rehabilitation program. PARTICIPANTS: Fifty-six persons with TBI. INTERVENTIONS: Participants in ICRP (n=27) received an intensive, highly structured program of integrated cognitive and psychosocial interventions based on principles of holistic neuropsychologic rehabilitation. Participants in SRP (n=29) received comprehensive neurorehabilitation consisting primarily of physical therapy, occupational therapy, speech therapy, and neuropsychologic treatment. Duration of treatment was approximately 4 months for both interventions. MAIN OUTCOME MEASURES: Community Integration Questionnaire (CIQ); and Quality of Community Integration Questionnaire assessing satisfaction with community functioning and satisfaction with cognitive functioning. Neuropsychologic functioning was evaluated for the ICRP participants. RESULTS: Both groups showed significant improvement on the CIQ, with the ICRP group exhibiting a significant treatment effect compared with the SRP group. Analysis of clinically significant improvement indicated that ICRP participants were over twice as likely to show clinical benefit on the CIQ (odds ratio=2.41; 95% confidence interval, 0.8-7.2). ICRP participants showed significant improvement in overall neuropsychologic functioning; participants with clinically significant improvement on the CIQ also showed greater improvement of neuropsychologic functioning. Satisfaction with community functioning was not related to community integration after treatment. Satisfaction with cognitive functioning made a significant contribution to posttreatment community integration; this finding may reflect the mediating effects of perceived self-efficacy on functional outcome. CONCLUSIONS: Intensive, holistic, cognitive rehabilitation is an effective form of rehabilitation, particularly for persons with TBI who have previously been unable to resume community functioning. Perceived self-efficacy may have significant impact on functional outcomes after TBI rehabilitation. Measures of social participation and subjective well-being appear to represent distinct and separable rehabilitation outcomes after TBI.

Source: CINAHL


Author(s) Fitzsimmons RD
The focus of this study was to be upon case management intervention with the longer-term, often insidious cognitive and behavioural problems of brain injured patients, to effect a cohesive response towards improvement of function and social/community reintegration. Ten 'in depth' case management studies were developed. Age, sex, cause of injury, time post-injury, nature of brain injury, sequelae and consequent intervention differed widely. Three studies are précised in this paper. There was no attempt to match or compare such a diverse group, each was accepted on the basis of need and potential benefit. Available information for each was studied. Field assessment was by the case manager who then engaged whatever appropriate resources could be mustered on behalf of the individual client. For some, this permitted access to funding for further assessments or specific inputs, for others there was nothing available other than existing statutory or voluntary agencies. For field assessment purposes, the case manager developed informal ratings of a range of disabilities within the cognitive and behavioural realms and the handicaps resulting. The assessments and nature of interventions are described, discussed and conclusions offered.

23. The cognitive impairments due to the occipito-parietal brain injury after gunshot. A successful neurorehabilitation case study

Author(s) Seniow J., Polanowska K., Mandat T., Laudanski K.


Author(s) Turkstra LS, Flora TL
of compensatory strategies for impairments in executive function. The strategies were designed to enable a client with traumatic brain injury (TBI) to obtain professional employment. In a series of individual speech-language therapy sessions, compensatory strategies were developed, refined, and trained in mock-interview situations. Significant improvements were noted in report-writing accuracy and self-reported stress during report-writing. The client was able to obtain and maintain competitive employment in his chosen profession. The results support the use of strategies aimed at supporting executive function to improve performance on verbal tasks, and were informative regarding the effects of self-perceived efficacy and stress on performance after TBI. They illustrate that intervention based on real-life supports may be effective even many years post-TBI.

LEARNING OUTCOMES: At the conclusion of this article, readers will: (1) identify aspects of executive function that relate to communication in the workplace, (2) describe the steps in considering intervention within a single subject research design framework, and (3) consider the effects of stress and perceived self-efficacy on performance of communication tasks.

Source: Medline

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In 2007, a conservative approach to managing severe TBI focused on avoiding overly aggressive therapy and managing medical complications. This approach, however, has been challenged by recent research demonstrating the potential benefits of more aggressive management strategies.

The Clinical Evaluation of Hyperbaric Oxygen Supplementary Therapy in the Treatment of Severe Traumatic Brain Injury after Craniotomy

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RA Neubauer, F Gerstenbrand - Journal of …, 2005 - hyperbaricoxygentherapy.org.uk

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The Analysis and Nursing of Applying Hyperbaric Oxygen Therapy Incipiently on Severe Brain Injury Patients
J Xiuming, C Ying - Today Nurse, 2010 - en.cnki.com.cn

In 2007, a conservative approach to managing severe TBI focused on avoiding overly aggressive therapy and managing medical complications. This approach, however, has been challenged by recent research demonstrating the potential benefits of more aggressive management strategies.

CLINICAL EFFICACY OF HYPERBARIC OXYGEN FOR TREATING THE PATIENT WITH SEVERE TRAUMATIC BRAIN INJURY
Z YE, J YANG, X XIAO - Modern Preventive Medicine, 2012 - en.cnki.com.cn

In 2007, a conservative approach to managing severe TBI focused on avoiding overly aggressive therapy and managing medical complications. This approach, however, has been challenged by recent research demonstrating the potential benefits of more aggressive management strategies.
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