

2. The Efficacy of Acquired Brain Injury Rehabilitation

On behalf of the ERABI Research Group

The rehabilitation of patients with acquired brain injury (ABI) involves a comprehensive effort by several members of an interdisciplinary team including but not limited to physicians, nurses, physiotherapists, speech language pathologists and occupational therapists. Considering the incidence and consequences of ABI, it is important to understand the effectiveness of rehabilitation. Efficacy, as measured by functional outcomes, will be assessed in this chapter across the continuum of care, from inpatient rehabilitation to community interventions.

2.1 Timing of Rehabilitation

Q. List some of the benefits of early admission of an ABI patient to rehabilitation.

Answer

- Improved functional outcomes (e.g., Functional Independence Measure scores)
- Shorter overall lengths of stay
- Decreased overall costs
- Higher cognitive levels at discharge
- Greater likelihood of discharge home

It has long been identified that early onset of therapeutic interventions for those who have sustained a traumatic brain injury (TBI) is beneficial. Literature has shown that introducing a rehabilitation program during the acute phase does assist in the overall recovery of individuals with a TBI (Heinemann 1990). A review by Cope (1995), concluded that those who receive early intervention do in fact have better outcomes than those who do not. Further, León-Carrión et al. (2013) reported that patients who received neurorehabilitation earlier demonstrated better global functioning at discharge than patients who began treatment at a later point.

Q. What evidence is there for early rehabilitation following brain injury?

Answer

- There is Level 2 evidence that early rehabilitation is associated with better outcomes such as shorter comas and lengths of stay, higher cognitive levels at discharge, better Functional Independence Measure scores, and a greater likelihood of discharge to home.

The studies available on the timing of rehabilitation demonstrate that earlier rehabilitation is associated with better outcomes than later rehabilitation. After an ABI patients typically need much greater medical and nursing support in order to meet their basic care requirements. This evidence is consistent with theories of neuronal plasticity, which suggest that challenging the nervous system by means of

therapy results in increased neuronal compensation and/or regeneration. However, delayed rehabilitation may reflect more severe or complicated brain injuries. Wagner et al. (2003) examined the proper timing for physical medicine and rehabilitation consultation. Using multivariate analysis, the authors found that when Physical Medicine and Rehabilitation consultations occurred earlier (<48 hours after hospital admission) patients experienced significantly better Functional Independence Measure (FIM) scores for transfers and locomotion and had significantly shorter lengths of stay (LOS). Mackay et al. (1992) assessed the timing of inpatient rehabilitation during the earlier phase of recovery in their cohort study. They compared a formalized program (average of two days to initiation of therapy) with a non-formalized program (average of 23 days to initiation of therapy) using co-relational analysis. The formalized program made greater functional and cognitive gains, had shorter LOS, and a greater likelihood of being discharged home. Modest findings were reported from High et al. (2006) in that all three time groups (less than 6 months, 6 to 12 months, greater than 12 months) demonstrated a significant decrease in required supervision from admission to discharge; however, the less than six month group continued to improve through to follow-up. Overall, starting rehabilitation early has been shown to be beneficial but there is an obvious need for a randomized controlled trial (RCT) to address this question.

Moreover, LOS in rehabilitation has also been linked with timing of rehabilitation. Cope and Hall (1982) found that those who were involved in rehabilitation earlier in the recovery stage were discharged from hospital earlier than those who were not involved in the early rehabilitation program, with those in the late intervention (>35 days) group spending significantly more time in acute care and inpatient rehabilitation. Kunik et al. (2006) also reported that those admitted sooner to rehabilitation were released on average 19 days post admission whereas those admitted later to rehabilitation were released on average 26 days post admission. Kunik et al. (2006) suggest that early admission is beneficial in terms of maximizing recovery and the overall cost of stay is less.

Despite the evidence demonstrated in these studies, one study reported no significant differences in earlier or later admission to rehabilitation. Edwards et al. (2003) compared 26 patients admitted to inpatient rehabilitation more than 200 days after injury with 264 patients admitted to inpatient rehabilitation less than 200 days after injury. Discharge Barthel Index and FIM scores were lower in the former group than in the latter (11 vs. 14 and 77 vs. 92, respectively). However, the differences were not significant. Rehabilitation LOS was also similar for the two groups.

2.2 Inpatient Rehabilitation

While many patients with ABI are discharged directly home or to a long term care facility, others are discharged to a dedicated inpatient rehabilitation service. These services vary from institution to institution but generally include some type of intensive therapy program for physical, social, behavioral and cognitive difficulties. Inpatient rehabilitation typically begins when a patient is medically stable enough to be transferred out of acute care and into a dedicated rehabilitation unit for a defined period of interdisciplinary rehabilitation.

Q. What evidence is there that inpatient rehabilitation improves the outcomes of patients with ABI?**Answers**

- There is Level 4 evidence that inpatient rehabilitation significantly improves functional outcome, as measured by the Functional Independence Measure.
- There is Level 4 evidence that inpatient rehabilitation results in successful return to work and return to duty for many military service members.

Functional outcome after discharge from inpatient rehabilitation was evaluated in a number of studies. The FIM was the most frequently used assessment tool, with numerous studies showing a significant improvement for this measure during inpatient rehabilitation (Bender et al. 2014; Cullen et al. 2013; Gray & Burnham 2000; Kim & Colantonio 2013; Sandhaug et al. 2010; Whitlock 1992; Whitlock & Hamilton 1995). Bender et al. (2014) reported an improvement in FIM scores during early rehabilitation, community care, and inpatient interval rehabilitation, with benefits that lasted up to one and a half years, despite the therapy only lasting 6–7 weeks. Bender et al. (2014) also report that patients who entered the interval rehabilitation program demonstrated improvement-rate increases comparable to initial rehabilitation levels, where the greatest gains are said to be made, highlighting the benefit of additional rehabilitation at later stages of recovery. This point has been made by earlier studies as well. A study noted that 53% of patients readmitted to inpatient rehabilitation at more than 12 months post-injury showed statistically significant improvement ($p=0.0001$) on Barthel Index scores from readmission to discharge (Tuel et al. 1992).

Braverman et al. (1999) evaluated military service members' return to work and return to duty after an 8 week multidisciplinary inpatient rehabilitation program. Braverman et al. (1999) reported 96% of the sample was employed at one year and 66% returned to duty.

Q. What evidence is there for the efficacy of inpatient rehabilitation in different types of acquired brain injuries?**Answer**

- There is Level 3 evidence that inpatient brain injury rehabilitation results in significantly greater gains in total Functional Independence Measure gain, self-care, and social cognition for patients with TBI when compared to patients with brain tumours. However, there are no statistically significant differences between the two groups regarding Functional Independence Measure, efficiency and length of stay.

In a retrospective, descriptive, case-matched study by O'Dell et al. (1998) 40 patients with brain tumours were compared with 40 patients with TBI. All patients underwent inpatient rehabilitation on a freestanding brain injury unit. Change in FIM scores, LOS, and discharge disposition were used as the main outcome measures. Overall, the TBI group made significantly greater gains in total FIM change (34.6 vs. 25.4), self-care (12.3 vs. 8.5), and social cognition (5.2 vs. 3.6). However, there were no

statistically significant differences between the two groups regarding FIM efficiency (1.9 vs. 1.5 FIM points per day) and LOS (22.1 vs. 17.8 days).

Q. What is the impact of age and gender on the outcomes of ABIs?

Answer

- There is Level 3 evidence that inpatient rehabilitation results in a higher rate of change on functional measures in patients aged 18–54 than patients aged 55 years or older.
- There is Level 4 evidence suggesting that being older, female, and having a longer length of stay in inpatient care results in a lesser likelihood of being discharged home.

Cifu et al. (1996) compared Disability Rating Scale, Rancho Los Amigos Scale (RLA) and FIM scores at inpatient rehabilitation discharge for 50 patients ≥ 55 years of age and 50 patients aged 18–54. In this case-control study, subjects in the younger group showed a higher mean rate of change on functional measures than subjects in the older group. Furthermore, Brown et al. (2012) found that older patients are less likely to be discharged home following inpatient care and females were more likely to be sent to care facilities than home. The authors speculate that because women tend to live longer than men, it may not be possible to discharge an older female patient home post TBI, especially if they live alone (Brown et al. 2012).

Q. What evidence is there for benefit of a transitional living setting at the end of inpatient rehabilitation?

Answer

- There is Level 2 evidence that a transitional living setting during the last weeks of inpatient rehabilitation results in greater functional independence in activities of daily living than inpatient rehabilitation alone.

There is reasonable evidence to support the use of interdisciplinary rehabilitation followed by a transitional living environment to assist in maximizing recovery (McLaughlin & Peters 1993). This suggests that a gradual return to the community is preferable to a sudden discharge from hospital to home. In the study by McLaughlin and Peters (1993) the effects of a transitional living setting during the last weeks of an inpatient stay were evaluated using cognitive (RLA) and functional levels (measured by the Barthel Index) as main outcome measures. Results from a follow-up survey showed that patients who participated in both inpatient rehabilitation and a transitional living setting reported greater independence in activities of daily living than patients who received inpatient rehabilitation alone.

2.3 Intensity of Rehabilitation

While patients are undergoing rehabilitation the amount of therapy provided to them is potentially an important factor in promoting neurological and functional recovery.

Q. What evidence is there that increasing rehabilitation intensity influences outcomes?

Answers

- There is Level 1b evidence that intensive rehabilitation improves functional outcome, as measured by Functional Independence Measure and Glasgow Outcome Scale scores, at 2 and 3 months post injury, but not necessarily at 6 months and beyond.
- There is Level 2 evidence that therapy intensity predicts motor functioning at discharge, but not cognitive gain.
- There is Level 4 evidence that increasing rehabilitation intensity reduces length of stay.
- There is Level 4 evidence that patients with a long length of stay who receive high-intensity rehabilitation fare better on the Rancho Los Amigos Scale at discharge than those who receive low-intensity rehabilitation.

When investigating the efficacy of intensity within inpatient rehabilitation programs, the majority of studies use the FIM to analyze cognitive and motor gains. Two RCTs were conducted to assess the effects of intensity level on functional gains (Shiel et al. 2001; Zhu et al. 2001). Shiel et al. (2001) found that patients receiving additional therapy from a health care professional (a rehabilitation nurse at one center and an occupational therapist at the other) made improvements at discharge on both the FIM and the Functional Assessment Measure; however, these improvements may be related to the size of the rehabilitation facility and the amount of staffing available to the patients. Despite that there was supposed to be an intensive group and routine therapy group at each site, patients in the larger facility received more intensive therapy over a shorter period of time. Therefore, the results should be interpreted with caution. In the second RCT, conducted by Zhu et al. (2001), subjects were randomly assigned to either 4 hours (study group) or 2 hours (control group) of rehabilitation per day. A greater number of subjects in the intensive therapy group, compared to controls, achieved full FIM scores and good Glasgow Outcome Scale scores at 2 and 3 months post injury; however, at the 6-month follow-up, despite initial improvements obtained in rehabilitation by the intervention group, the control group had made significant gains. The control group was said to be “catching up” and there were no significant difference in the motor or cognitive FIM scores between the two groups (Zhu et al. 2001). Both studies noted a trend towards improvements in functional gains with increased intensity but additional research is needed in this area.

Study Snapshot**Does intensive rehabilitation improve the functional outcome of patients with traumatic brain injury? Interim results of a randomized controlled trial (Zhu et al. 2001).**

- Patients (N=36) with moderate and severe TBI (GCS 3–12) were randomized into two groups, an intervention group and a control (conventional rehabilitation) group.
- The intervention group received 4 hours of therapy 5 days per week while the control group received 2 hours of therapy 5 days per week.
- Patients were compared on Glasgow Outcome Scale and Functional Independence Measure scores monthly during training and after completion of rehabilitation for 6 months.
- Patients in the intervention group saw significant improvements in overall Glasgow Outcome Scale scores ($p=0.037$) 1 month post injury and were more likely to achieve “good” Glasgow Outcome Scale outcomes after 2 months ($p=0.046$) despite insignificant differences in overall Glasgow Outcome Scale scores.
- At 3 months the percentage of those achieving “good” Glasgow Outcome Scale scores could only approach significance ($p=0.058$) and by 6 months, there were no significant differences on any Glasgow Outcome Scale scores between the intervention and control groups.
- Functional Independence Measure total scores increased exponentially from baseline to 1-month follow up with mean scores more than doubling from 47 to 98. However, these were not significantly different from the conventional group who reported near-identical improvement.
- No significant differences were found on any of the Functional Independence Measure measures during the 6-month study period.

Cifu et al. (2003) examined the efficacy of rehabilitation intensity and functional gain in relation to the hospital LOS in a multicenter, prospective controlled trial. Rehabilitation intensity was found to predict motor functioning at discharge ($p<0.001$) but not cognitive gain ($p<0.05$; Cifu et al. 2003). However, both cognitive and motor abilities at admission were significant predictors of LOS ($p<0.01$). LOS was significantly decreased (31%) for both acute care and coma groups with increased intensity (Blackerby 1990). Further, Spivack et al. (1992) conducted a study looking at the combined effects of rehabilitation intensity and inpatient rehabilitation LOS. In their comparison of patients who had a long LOS and received low-intensity or high-intensity rehabilitation, the latter group fared better on the Rancho Los Amigos Scale at discharge.

Intuitively, it seems reasonable to assume that more therapy will result in more rapid and ultimately greater improvement in recovery from brain injury. Based on the available literature, greater intensity appears to result in a faster recovery and therefore shorter LOS, but not necessarily better outcomes at 6 months. More studies are needed in this regard.

2.4 Community Rehabilitation

Following discharge from inpatient rehabilitation patients with moderate to severe brain injury typically receive ongoing therapy at a lesser intensity. While most patients move back to their former living environment with therapy being provided to them in the home or community, some patients go on to other facilities that may provide a longer duration of treatment for the slow-to-recover patient.

Q. What evidence is there that ABI rehabilitation provided in the community improves outcomes?**Answers**

- There is Level 1b evidence that structured multidisciplinary community-based rehabilitation is more effective in improving functional ability, as well as activity, participation, and psychological aspects of functioning in the community compared to educational booklets.
- There is Level 2 evidence that a high-level of involvement in neurorehabilitation goal setting results in a greater number of attained goals being maintained at follow-up (2 months), whereas patients with low-involvement show a decline in the number of goals attained.
- There is Level 4 evidence that participation in a comprehensive day treatment program reduces impaired self-awareness and distress, as well as improving societal participation at 1 year follow-up.

For continuity of rehabilitation community-based programs are needed following inpatient rehabilitation and should be tailored to individuals' needs in order to maximize their recovery. Powell et al. (2002) randomly assigned patients with TBI to an outpatient support program where patients received 2–6 hours of therapy a week at home or in another community setting, or to a control group that received an information session at home. Patients in the intervention group showed improvements in cognitive functioning, mobility, and personal wellbeing. Areas such as socializing and competitive employment rates showed no relative difference between groups, the authors suggest that this reflects external influences beyond the control of the rehabilitation team. The authors recommend that this type of outpatient approach be applied to a broader range of patients with ABI in a larger trial to confirm their results.

Wood et al. (1999) found that rehabilitation of at least six months led to greater independence, higher social activity levels, and less need for care support. To accomplish independence and reintegration back into community settings, patients are encouraged to set goals in order to assist their transition. When examining involvement in goal-setting in neurorehabilitation, Webb and Glueckauf (1994) found that patients who had greater involvement in goal-setting maintained their improvements at study follow-up; contrarily, those with low involvement in their goal setting showed a decline in the number of goals attained. Not surprisingly, it is beneficial to have the patients highly involved in the goal setting as it ensures the goals are meaningful and thus, the motivation of the patient is increased. Ownsworth et al. (2008) performed a RCT to compare individual occupation-based support, group-based support, and a combination of the interventions for goal attainment and psychosocial functioning. The individual occupation-based support contributed to gains in performance in goal-specific areas. The combined intervention was associated with maintained gains in satisfaction and performance, while the group and individual interventions were more likely to result in gains in behavioural competency and psychological well-being.

Participation has also been an area of interest in regards to how patients reintegrate themselves into societal and occupational environments. With regards to societal participation, Malec (2001) found that one year after participation in a comprehensive day treatment program 72% were living independently, 39% were working independently, 10% were in transitional placements, and 18% were involved in

supported or volunteer work. Malec and Moessner (2000) reported that after participation in a comprehensive day treatment program, patients experienced reduced impaired self-awareness and distress, both of which were significant predictors of goal attainment. In this sense, focusing on psychosocial factors can assist patients to achieve their goals and independence; however, neither was related to employment.

Study Snapshot

Community based rehabilitation after severe traumatic brain injury: a randomized controlled trial (Powell et al. 2002).

- Outreach rehabilitation was provided for patients with severe TBI by a multidisciplinary team that included two occupational therapists, a physiotherapist, a speech and language therapist, a clinical psychologist and a half-time social worker.
- Participants (N=110) were randomized into either the treatment group or the control group
- The treatment group received individualized assistance (i.e. goal-planning, occupational therapy, physiotherapy, involvement in leisure/educational activities) by the multidisciplinary team for two sessions per week for approximately 27 weeks in a community setting.
- The control group received a specially collated booklet highlighting relevant resources.
- Follow-up occurred on average at the 24.8 month mark.
- Primary outcome measures were the Barthel Index and the Brain Injury Community Rehabilitation Outcome-39 focused on measuring participation and activity levels.
- Secondary outcome measures included the Functional Independence Measure, the Functional Assessment Measure and the Hospital Anxiety and Depression Scale (for a subgroup of 46 participants).
- Results demonstrated that the patients in the treatment group were significantly more likely to show improvements in primary outcome measures, as well as self-organization and psychological wellbeing. Improvements were also seen on the Functional Independence Measure and Functional Assessment Measure personal care and cognitive function subscales for the treatment group but these only approached significance ($p=0.06$ and $p=0.09$, respectively).

Q. What is the impact of a community-based rehabilitation program for patients with a dual diagnosis of TBI and substance abuse?

Answer

- There is Level 4 evidence that patients with a dual-diagnosis of TBI and substance abuse often do not benefit from community-based treatment programs to become chemical-free due to lack of compliance on the part of the patient.

Blackerby and Baumgarten (1990) conducted a series of single subject intervention studies on seven individuals with TBI and substance abuse problems. In this study, the intervention was a dual diagnosis treatment program known as RELATE (Rebound Lifestyle Adjustment Team) that took place within

community-based Alcoholics Anonymous or Narcotics Anonymous groups. The authors discovered that both of the clients who followed recommendations for additional rehabilitation or psychiatric treatment at discharge from the program remained drug-free. On the other hand, only one of the five clients who did not follow recommendations remained drug-free at follow-up, while three continued their chemical dependency and one client's follow-up status was unknown. Overall, the program was relatively unsuccessful due to an inability to keep clients in the program for the 6 month period desired and the clients' failure to follow discharge treatment recommendations.

2.5 Vocational Rehabilitation

Returning to work following ABI is one of the most challenging tasks that a patient will face in the course of their recovery. The work environment often produces stresses on their physical body, cognitive challenges, and emotional strain. However, given the financial burden of not being able to work for most individuals, it is a very important aspect of full reintegration into society and return to independent living.

Q. What is the evidence that vocational rehabilitation is of benefit in persons with ABI?

Answers

- There is Level 4 evidence that individualized work re-entry programs are effective.
- There is Level 4 evidence that following vocational rehabilitation the majority of subjects have fair or good adjusted outcomes, while over one-third become gainfully employed or full-time students.
- There is Level 4 evidence that individuals with the most significant cognitive impairments benefit the most from vocational rehabilitation services.
- There is Level 4 evidence that individuals with severe head injury do benefit from supported employment services.

The benefits for patients to enter a vocational rehabilitation program appear to be plentiful and cost-effective. In a cost-benefit analysis by Abrams et al. (1993), an individualized work re-entry program was evaluated. Of the 142 persons with TBI who participated in the program, 65% obtained employment during the first year of entering the program and 75% obtained employment during the entire observation period (from October 1988 to July 1992). This resulted in a 2:1 ratio of total taxpayer benefit to total program operational cost and a 4:1 ratio of total taxpayer benefit to state cost.

Klonoff et al. (1998) looked at the adjusted outcome of 64 subjects who participated in the Adult Day Hospital for Neurological Rehabilitation Work/School Re-entry program. At discharge, 89.5% of the subjects displayed fair or good adjusted outcome. Further, 62.5% of subjects were gainfully employed or involved in full-time studies at discharge, while 15.6% returned to their pre-injury level of work or school.

A systematic review by Tyerman (2012) endorsed individualized programs for return to work. Patients' characteristics (i.e. physical and cognitive abilities, severity of injury) need to be matched appropriately with the correct type of rehabilitation and intensity. Furthermore, Tyerman (2012) stressed the importance of the patient's goals, as work may not be their primary goal and premature return to work

could potentially cause psychological issues and vocational difficulties. Johnstone et al. (1999) examined the relationship between receiving services from the Missouri Division of Vocational Rehabilitation and neuropsychological variables and vocational outcomes. They separated 110 patients into the following three groups: successfully employed, services interrupted, and no services provided. The results from Johnstone et al. (1999) suggest that even individuals with significant cognitive deficits can benefit from vocational rehabilitation services, and individuals should not therefore be deemed ineligible for such services based solely on neuropsychological test scores.

There is good reason to believe that vocational programs are useful in assisting patients with moderate to severe brain injury with their vocational goals. In doing so, the benefits to the individual financially, and in terms of their self-esteem, are positive. In addition, there is an obvious savings to the taxpayer to have programs designed towards assisting patients with returning to work.

2.6 Supported Employment

Once a patient with brain injury has returned to competitive employment they are at a high risk for failure because of the lingering effects of their brain injury.

Q. What evidence is there for the benefit of supported employment following ABI?

Answer

- There is Level 2 evidence that cognitive symptom management and rehabilitation with standard supported employment results in greater employment rates, improved memory and a reduction in psychiatric and post-concussive symptoms.
- There is Level 3 evidence that supported employment improves competitive employment outcomes particularly for individuals with ABI who are older, have more education, have no prior work experience or who have suffered more severe injuries.

Supported employment has a good track record of improving the chances of patients with ABI finding employment. In a study by Gamble and Moore (2003), 78 patients with TBI received supported employment (treatment group), while 995 patients with TBI did not receive supported employment (control group) during vocational rehabilitation. Overall, supported employment significantly improved the level of competitive employment (67.9%) compared to those who did not receive supported employment (47%). Gamble and Moore (2003) found that the provision of supported employment services contributed to competitive employment outcomes particularly for clients who had 12 or more years of education, prior work experience and severe TBI, and were over 35 years of age and male. For those that do return to work, Wehman et al. (1990) found that most individuals reached a point of stability and independence on the job within 20 weeks of working.

Despite the prominence of supported employment, other approaches have been tested to compete with such programs by focusing on additional functional aspects that further the patients' abilities in the workplace. Twamley et al. (2014) compared enhanced supported employment with CogSMART, a cognitive symptom management and rehabilitation therapy plus supported employment with veterans. It was found that although there were no statistically significant differences between the two groups on

psychological issues, more participants in the CogSMART group obtained employment in the first 14 weeks of treatment (50% vs 28%). CogSMART participants also demonstrated significantly greater improvements in memory (Twamley et al. 2014). Despite such programs being effective in helping individuals obtain employment, the evidence favoring the utilization of supported employment programs in order to maximize the earning potential of these individuals post ABI is limited. There is a clear need for more data in this area to delineate the most appropriate strategies to facilitate job retention, maximize earnings, and achieve vocational success.

2.7 Support Groups

Living in the community following brain injury can often result in isolation and depression in individuals who no longer possess the capacity to seek help via appropriate means. Support groups are frequently organized in the community in order to diminish these feelings of isolation and provide assistance through group discussion forums.

Q. What evidence is there that support groups are of benefit for patients with ABI?

Answer

- There is Level 4 evidence that support groups generate positive results such as improving feelings of hopelessness, coping with depression, reducing aggression, and improving psychosocial functioning.

Studies examining the efficacy of support groups typically examine emotive feelings and psychosocial issues amongst patients. However, aggression is an issue for many patients. Aboulafia-Brakha et al. (2013) revealed that patients were able to reduce aggressive tendencies and regain control of their emotions much more effectively after group anger management therapy. However, improvements were not observed until the course was completed in full; thus, patients need to ensure that they complete the therapy in its entirety in order to benefit.

Three studies focused on the efficacy of support groups. Based on these studies, the support groups resulted in significant improvements in feelings of self-efficacy, a reduction in feelings of hopelessness, and being vocationally active (Armengol 1999), quality of life and coping with depression (Hibbard et al. 2002), and improving psychosocial functioning and self-awareness (Ownsworth et al. 2000). Social issues discussed during family focus groups were investigated by Straits-Troster et al. (2013) who revealed a need to rebuild relationships, reduce isolation and develop coping skills. By increasing socialization amongst their peers, the patients were able to improve their communication skills which may be a potential format for future support group methodologies.

There is currently only low level evidence for the use of support groups in an ABI population; however, they appear to be an excellent vehicle for dissemination of information regarding living in the community with an ABI and provide direction to other resources if warranted. There is a need for further evaluation of these groups in order to define the most effective design of these programs.

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