IMPLEMENTING A PHYSICAL ACTIVITY CENTERED EDUCATION PROGRAM FOR
INDIVIDUALS WITH BRAIN INJURY

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Research has shown that health promotion programs (HPP) that incorporate education about physical activity (PA) are one mode of rehabilitation that can improve the health of individuals with disabilities. However, education-based PA curriculum is not included in the rehabilitation program for individuals with a brain injury, indicating a gap in services provided. Consequently, the purpose of this study was to create and deliver a physical activity centered education (PACE) program that supplemented the existing rehabilitation program for brain injury. PACE consists of an 8-week (16 session) program aimed to (1) increase self-efficacy for being physically active of PACE program participants, (2) increase PA stage of change in PACE program participants or the maintenance of adequate level of PA, and (3) improve the rehabilitation outcomes (i.e., abilities, participation, adjustment) of PACE program participants. Based on previous research, it is hypothesized that participation in PACE will result in (1A) increased self-efficacy for PA, (1B) greater self-efficacy for PA than the standard of care group, (2A) increased readiness to be physically active, (2B) greater readiness to change their PA behavior than the standard of care group, (3A) improved rehabilitation outcomes, and (3B) greater rehabilitation outcomes than the standard of care group. The PACE program resulted in: (1) an average increase of 19.36% in participants’ PA self-efficacy (effect size [ES] = 0.37), (2) 15 of the 22 PACE participants (68.18%) reported readiness to engage in regular PA, and (3) an increase in rehabilitation outcomes (i.e., abilities, adjustment, and participation). In conclusion, the PACE program can improve PA self-efficacy, readiness for regular PA behavior, and improved short-term rehabilitation outcomes.
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# TABLE OF CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................... iii

LIST OF TABLES ......................................................................................................................... vi

LIST OF FIGURES ...................................................................................................................... vii

INTRODUCTION ...........................................................................................................................1
  Physical Activity and Sedentary Behaviors ................................................................. 3
  Sedentary Behavior and Resulting Health Disparities .................................................. 4
  The Transition: Health Promotion History and Trend .................................................... 5
  Guidelines for Developing an Effective HPP ................................................................. 7
  Theoretical Framework ................................................................................................. 7

LITERATURE REVIEW ..............................................................................................................12
  Preliminary Research for PACE Development ............................................................... 16
  PACE Aims and Hypotheses ......................................................................................... 19

METHODOLOGY ........................................................................................................................21
  Participants ....................................................................................................................... 21
  Procedure ......................................................................................................................... 22
  Clinical Issues .................................................................................................................. 24
  PACE Development ....................................................................................................... 26
  PACE Pilot Work .............................................................................................................. 28
  Measures ......................................................................................................................... 30
  Data Analysis ................................................................................................................... 33

RESULTS ......................................................................................................................................35

DISCUSSION ................................................................................................................................39
  Measurement Outcomes ............................................................................................... 39
    Improved Rehabilitation Outcomes .............................................................................. 39
    Improved Self-Efficacy ................................................................................................. 40
    Declines in Self-Efficacy ............................................................................................. 41
    Intention to be PA ....................................................................................................... 42
<table>
<thead>
<tr>
<th></th>
<th>LIST OF TABLES</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Conditions Associated With Brain Injury</td>
<td>2</td>
</tr>
<tr>
<td>2.</td>
<td>Processes of Change</td>
<td>9</td>
</tr>
<tr>
<td>3.</td>
<td>PACE Topics and Session Sequence</td>
<td>27</td>
</tr>
<tr>
<td>4.</td>
<td>Components of a PA Intervention (USDHHS, 2008)</td>
<td>27</td>
</tr>
<tr>
<td>5.</td>
<td>PACE Study Measurements</td>
<td>30</td>
</tr>
<tr>
<td>6.</td>
<td>PACE ParticipantDemographics</td>
<td>49</td>
</tr>
<tr>
<td>7.</td>
<td>Standard of Care Group Characteristics</td>
<td>50</td>
</tr>
<tr>
<td>8.</td>
<td>PACE Participant Characteristics</td>
<td>52</td>
</tr>
<tr>
<td>9.</td>
<td>Standard of Care Demographic Characteristics</td>
<td>53</td>
</tr>
<tr>
<td>10.</td>
<td>MPAI-4 Results PACE</td>
<td>54</td>
</tr>
<tr>
<td>11.</td>
<td>MPAI-4 Results for Standard of Care</td>
<td>54</td>
</tr>
<tr>
<td>12.</td>
<td>Self-Efficacy Results PACE</td>
<td>55</td>
</tr>
<tr>
<td>13.</td>
<td>Self-Efficacy Standard of Care</td>
<td>56</td>
</tr>
<tr>
<td>14.</td>
<td>Stage of Change Results PACE</td>
<td>56</td>
</tr>
<tr>
<td>15.</td>
<td>Exercise Stage of Change Standard of Care</td>
<td>58</td>
</tr>
<tr>
<td>16.</td>
<td>Z test for Significance</td>
<td>58</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conceptual flow of stages of change</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>Conceptual relationship of social cognitive theory factors</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Conceptual relationship of factors that contribute to health for people with disabilities</td>
<td>11</td>
</tr>
</tbody>
</table>
INTRODUCTION

Brain injury, whether traumatic or acquired (e.g., stroke), results in widespread and costly burden that challenges injured individuals, their family members, and the US health care system. Traumatic brain injury (TBI) is caused by a bump, blow, or jolt to the head or by an object penetrating the skull and into the brain (Faul et al., 2010).

Complex in nature, TBI may range from “mild” (i.e., a brief change in mental status or consciousness) to “severe,” (i.e., an extended period of unconsciousness or amnesia after surgery; Faul, Wald, & Coronado, 2010; Finkelstein, Corso, & Miller, 2006; Kalpakjian, Lam, Toussaint, & Hansen Merbitz, 2004). As a result, TBI requires varied and individualized treatment that, in 2000, accounted for an estimated $60 billion (Finkelstein et al., 2006) in direct and indirect medical costs (i.e., lost productivity).

Stroke, the third leading cause of death for both men and women (Heron et al., 2006) afflicts 795,000 Americans yearly and in 2009, accounted for $68.9 billion on costs attributed to health care services, medications, and missed days of work (Lloyd-Jones et al., 2009). Statistics show that the young (i.e., children aged 0-4 years, older adolescents aged 15 to 19 years) and older adults (i.e., ages 65 and older) sustain the highest proportion of TBIs annually (Finkelstein et al., 2006). However, neither TBI or stroke discriminates based on gender, age, or race (Heron et al., 2006).

As a result of brain injury, individuals are subsequently categorized under the umbrella of disability and face a variety of associated, secondary, and/or chronic conditions. These conditions are either directly/indirectly linked to the primary injury. Associated conditions directly linked to the brain injury (see Table 1) are not preventable, but can be managed through effective rehabilitation efforts. Identifying ways to help manage these conditions, and
subsequently reduce health care costs, poses a significant challenge for rehabilitation centers and health promotion researchers.

Secondary/chronic conditions (see Table 1) can either be directly or indirectly related to brain injury and may be associated with the inability to overcome physical, cognitive, psychosocial, and environmental barriers (Driver, 2009). However, unlike associated conditions, secondary/chronic conditions are not imminently linked to the primary injury. Consequently, secondary/chronic conditions can be prevented, which further reduces the health care cost associated with brain injury. Thus, the opportunity exists for rehabilitation centers to develop health promotion programs that assist individuals with brain injuries in effectively managing associated conditions, while reducing incidence of chronic/secondary conditions.

Table 1

*Conditions Associated with Brain Injury*

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Associated condition</th>
<th>Secondary/chronic conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor control</td>
<td>Partial paralysis, ataxia (协调 movement), incoordination, imbalance, lack of control/timing of movements</td>
<td>Physical inactivity, CVD, hypertension, diabetes mellitus</td>
</tr>
<tr>
<td>Sensory</td>
<td>Loss of ability to feel pain or temperature, altered sense of smell</td>
<td>Poor nutrition</td>
</tr>
<tr>
<td>Cognition</td>
<td>Aphasia (ability to understand language), memory loss, disrupted attention, reasoning, attention, and problem-solving</td>
<td>Depression, anxiety, alcoholism</td>
</tr>
<tr>
<td>Psychosocial</td>
<td>Agitation, confusion, impulsiveness, apathy, poor judgment</td>
<td>Depression, anxiety, alcoholism</td>
</tr>
</tbody>
</table>

Acknowledging this opportunity, current health promotion and rehabilitation research is trending toward the implementation of health promotion programs (HPP) that aid in the management of associated conditions and the prevention of secondary/chronic conditions.
(Abdullah et al., 2004; Friedman et al., 1997; Hughes et al., 2003; Kahn et al., 2002; Ravesloot et al., 2005; Rimmer et al., 2000; Stuifbergen et al., 2003). Depending on the area of focus, HPP could include one or more components that address: nutrition, smoking cessation, alcohol reduction/cessation, spiritual growth, interpersonal relations, stress management, etc. Another component of HPP is physical activity (PA). PA is a leading worldwide indicator of health (i.e., reduction in premature death all cause, reduction in the risk of developing adult onset diabetes, colon cancer, high blood pressure, and heart disease (Centers for Disease Control and Prevention [CDC], 2010; Slack, Marion, 2006; US Department of Health and Human Services [USDHHS]: Surgeon General’s Report, 1996; USDHHS, 1999). Hence, PA is a critical HPP component whose objective is to improve health outcomes for the general public and for individuals living with disability (IWD).

Although extensive research supports the association between PA and positive health outcomes for the general public and IWD, no such research exists for the population living with brain injury. Therefore, the objective of this study was to implement a physical activity centered education (PACE) program that aims to (a) increase the self-efficacy for being physically active for participants in the PACE program, (b) increase readiness for regular PA of participants in the PACE program, and (c) improve the rehabilitation outcomes (i.e., abilities, participation, adjustment) of participants in the PACE program.

Physical Activity and Sedentary Behaviors

PA is a multidimensional behavior that can be conceptualized as having both active and sedentary components (Pettee-Gabriel, Morrow, & Woolsey, 2012). Extensive evidence exists supporting PA as a worldwide leading indicator of health (i.e., reduction in premature death all
cause, reduction in the risk of developing adult onset diabetes, colon cancer, high blood pressure, and heart disease (CDC, 2010; Slack, Marion, 2006; USDHHS: Surgeon General’s Report, 1996; USDHHS, 1999). Conversely, sedentary behaviors, or the lack of human movement, are associated with adverse health outcomes. The increase in U.S. sedentary time is captured within the data collected by the CDC’s Surveillance System (Behavioral Risk Factor Surveillance System [BRFSS]). Along with the increase in sedentary time among US citizens is an increase in the burden of non-communicable disease both nationally and worldwide (CDC, 2012; WHO, 2012). In response, the WHO drafted a global PA strategy in 2002 to address the 60% of global deaths and 43% of the global burden of disease attributed to sedentary lifestyles (WHO, 2002).

In the U.S., the medical community, research scientists, and public health officials collaborated to review and develop health objectives for their citizens. As a result of this collaboration, Healthy People 2010/2020 and the U.S. Department of Health and Human Services published a guide to PA (USDHHS, 2009) and developed nationally recognized objectives (HP 2010/2020) to address the U.S. burden of inactivity. In the United States, inactivity is listed as a leading risk factor for heart disease (National Institutes of Health/ National Heart, Lung, and Blood Institute [NIH/NHLB], 1999) as well as a leading risk factor for adult onset diabetes (National Institutes of Health/ National Diabetes Education Program [NIH/NDEP], 2011). Other health burdens attributed to inactivity are hypertension, obesity, increased risk for colon cancer, and increased risk for hip fractures (USDHHS: The Surgeon General’s Report: A Call to Action, 1996).

Sedentary Behavior and Resulting Health Disparities

In addition to recognizing inactivity as a serious health issue within the general population, public health officials are beginning to address the consequence of sedentary
behavior among IWD. In the first published Surgeon General’s report (USDHHS: *The Surgeon General’s Report: A Call to Action*, 1996), a section was drafted to inform IWD about the health benefits of PA and the risks of inactivity. Also included in this section was the statement that IWD are less likely to engage in consistent, moderate PA (i.e., activity intense enough to receive healthful benefits) (USDHHS: Guidelines for PA, 2008) than those living without a disability. Statistics in context to this health disparity were compiled into the largest U.S. Health data set for IWD. This compilation of data (Centers for Disease Control and Prevention’s Healthy People 2010 Data, 2010) measured health at the population level and highlights areas of disparity for IWD. The data revealed that this population was more likely to (a) not engage in PA, (b) be overweight or obese, (c) have high blood pressure, (d) receive less social-emotional support, and (e) have lower employment rates than the general population leaving without disability. In recognition of these health disparities, health promotion efforts began to transition away from the established focus on prevention (i.e., of illness, disability, and death and toward a progressive focus on interventions that would close/shrink the health disparity gap.

The Transition: Health Promotion History and Trend

Historically, the public health effort directed toward disability has been one of prevention (Lollar & Crews, 2003). For example, research focus and resources were allocated to find ways to prevent disabling conditions (i.e., neural tube defects, cerebral palsy, spinal cord injury, and acquired brain injuries: Lollar & Crews, 2003), but little investment was made to support the needs of individuals who acquired or developed a disabling condition. These individuals who develop/acquire disabling conditions are at an increased risk for obtaining other conditions related to the primary condition or injury. Recognizing this health disparity among those who
have acquired a disability and realizing the ensuing burden of associated, secondary, and chronic conditions, public health science has moved toward the trend of developing and implementing PA-centered HPP (Lollar & Crews, 2003).

Proof that U.S. health promotion efforts are moving toward supporting individuals who have acquired disabilities is manifest in the objectives of Healthy People 2010. Healthy People (i.e., the health agenda for the nation) provides a framework for public health activities in policy, research, and intervention. Healthy People 2010 was the first Healthy People document to dedicate a chapter supporting the health of IWD (Lollar & Crews, 2003). Building upon the momentum of HP 2010, Healthy People 2020 increases the number of objectives focused on the 20.9 million IWD (United States Census, 2000). These objectives support the (a) inclusion of IWD into public health activities, (b) opportunity for IWD to receive well-timed interventions/services and interact with an environment free of barriers (e.g., using both physical universal design concepts and operational policy shifts), and (c) chance for IWD to participate in everyday activities (HP 2020). Furthermore, the American Public Health Association (the most recognized and influential public health agency in the world) subsequently established a disability section to meet the population’s health needs (Rimmer, 2011).

As a result of these efforts, there is a unified national resolve to address the health needs of IWD utilizing effective HPP. In order to develop effective HPP, health promotion entities should identify the existing health disparities, review the objectives laid out in HP2010/2020, and subsequently implement a HPP that reduces disparity while meeting nationally recognized health objectives. Through careful planning and development, HPP have been shown to facilitate the adoption and maintenance of health behavior change (Abdullah et al., 2004; Ravesloot, Seekins, & White, 2005; Ravesloot, Seekins, & Cahill, 2007; Rimmer et al., 2000; Rimmer & Braddock, 2002;
Guidelines for Developing an Effective HPP

In 1999, the USDHHS, the CDC, the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), and the Division of Nutrition and Physical Activity (DNPA) published, Promoting Physical Activity: a Guide to Community Action as a guide for the development of effective HPP. The USDHHS’s Guide to Community Action advises that health promotion advocates follow a systematic approach in developing HPP. The first development step is to define a specific target audience versus pursuing various populations simultaneously. Through careful audience profiling, the HPP objectives can target the specific needs of those individuals and increase the likelihood of long-term behavior change (USDHHS, 1999). The next step in creating a HPP is to incorporate behavioral strategies drawn from established behavioral theory and models. Thus, with the objective of supporting the environment of the target audience and strengthening the target audience’s intention to change, behavioral strategies can be an effective tool when developing HPP.

Theoretical Framework

The transtheoretical model of behavior change (TMBC; Prochaska, 1997), which assesses an individual’s readiness to adopt healthy behavior(s), and social cognitive theory (SCT), which identifies self-efficacy as a significant influence on health behavior, have both been used as an educational reference for health promotion research. Drawing upon key concepts from TMBC and SCT, HPP can be designed to facilitate healthy behavior change (Miilunpalo et al., 2000; Parker et al., 2001; Prochaska et al., 2009; Stretcher et al., 2002).
Proposed by Prochaska in the 1970s, TMBC, describes the common stages of behavior change while placing focus on the individual’s readiness to adopt a healthy behavior(s) (Proschaska & DiClemente, 2001). TBMC is based on the idea that an individual moves through stages of change before he or she is ready to engage in health-related action (Nieuwenhuijsen et al., 2005). This passage has been described as a sequential spiral (Nieuwenhuijsen et al., 2005) (see Figure 1) with the potential to relapse to previous stages. The underlying understanding of TBMC is that change is a process, not an event.

Figure 1. Conceptual flow of stages of change (adapted from Proschaska and DiClemente’s transtheoretical model of change).

The stages of change as identified by Prochaska and DiClemente are precontemplation (i.e., not intending to take action in the foreseeable future); contemplation (i.e., people are intending to change in the next 6 months); preparation (i.e., people are intending to take action in the near future); action (i.e., people have made specific, overt modifications in their lifestyles within the past 6 months); maintenance (i.e., people are working to prevent relapse) (Prochaska, 1997). Within HPPs, processes of change are defined by Prochaska as “covert and overt activities that people use to progress through the stages of change” (see Table 2).
Table 2

*Processes of Change*

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<tr>
<th>Processes of Change</th>
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<tr>
<td>Consciousness raising</td>
<td>Increased awareness of causes, consequences, and cures for problem behavior</td>
</tr>
<tr>
<td>Self-Reevaluation</td>
<td>The cognitive and affective assessments for one’s self-image with/without a healthy habit</td>
</tr>
<tr>
<td>Environmental Reevaluation</td>
<td>The affective and cognitive assessment of how the presence/absence of behavior affects others</td>
</tr>
<tr>
<td>Counter Conditioning</td>
<td>The learning of healthier behaviors that can substitute for unhealthy behaviors</td>
</tr>
<tr>
<td>Contingency Management</td>
<td>The use of rewards for positive behavior</td>
</tr>
<tr>
<td>Helping Relationships</td>
<td>Social support</td>
</tr>
</tbody>
</table>

*Note.* Adapted from Prochaska & DiClemente, 1997.

Other indicators of positive behavior change within TMBC are decisional balance (i.e., individual’s weighing of pros and cons of healthy/unhealthy behaviors) and self-efficacy (i.e., the belief that one can achieve a goal even in the face of barriers). With an understanding of what indicators/components of healthy behavior change are, TMBC can be used as a helpful tool in identifying individual stages of behavior change. Consequently, if researchers clearly define the desired objectives for healthy behavior change using TMBC, HPP developers can then implement strategies to achieve those objectives.

Also used as a tool for understanding behavior change, Albert Bandura’s SCT proposes that health behavior is influenced by a complex, interactive, reciprocal relationship among the person, the social environment, and behaviors (Bandura, 1995; see Figure 2).
In context to SCT, self-efficacy, is the theory’s cornerstone and is determined by four interrelated experiences: performance accomplishments, vicarious experiences, social persuasion, and emotional arousal. Another key component to SCT is the relationship of the person to his/her environment. The environment, as explained by Bandura, influences, shapes, or may constrain behavior change.

The effect of the environment on the lives of IWD is a key determinant in the success or failure of healthy behavior change. This effect of the environment on IWD is depicted in the empowerment dyad (see Figure 3) conceptualized by Rimmer and Rowland. Rimmer and Rowland capture the symbiotic relationship of the enabled environment and the empowered person. This relationship is the key to supporting healthy behavior change (Rimmer & Rowland, 2008; see Figure 3). For example, a person can be highly responsive to a HPP (i.e., motivated or have a strong interest), but may not have access to a fitness facility or safe sidewalks/bike paths. Again, according to SCT, self-efficacy (i.e., empowering a person through knowledge) and a
supportive environment (enabling environments) are crucial in facilitating healthy behavior change.

**Figure 3.** Conceptual relationship of factors that contribute to health for people with disabilities.

TMBC and SCT provide a framework for identifying the components of behavior change and for evaluating the efficacy of health behavior interventions in rehabilitation settings (Nieuwenhuijen et al., 2005). Consequently, HPP have used behavioral strategies based on TMBC (Lox & Freehill, 1999; Martin, 2002; McAuley, 1993; McAuley & Blissimer, 2000) and SCT (Dishman, Vandenberg, Motl, & Nigg, 2010; Driver, Ede, Warren, & Stevens, 2009; Kirk, MacMillan, & Webster, 2010; Pekmezi, Barbera, & Marcus, 2010) to facilitate the adoption and maintenance of PA behaviors of IWD
LITERATURE REVIEW

With limited research available to evaluate the efficacy of HPP on brain injury, the review of HPP studies was inclusive of different classifications of disability. Numerous research studies have reported a decrease in the incidence of secondary/chronic conditions for IWD who participated in PA-centered HPP (Abdullah et al., 2004; Ravesloot, Seekins, & White, 2005; Ravesloot, Seekins, & Cahill, 2007; Rimmer et al., 2000; Rimmer & Braddock, 2002; Rimmer, Silverman, Braunschweig, Quinn, & Liu, 2002; Stuibergen, Becker, Blozis, Timmerman, & Kullberg, 2003).

Ravesloot and colleagues developed, implemented, and evaluated the Living Well with a Disability program. Within the assessment, researchers evaluated the efficacy of the program to reduce the incidence and severity of secondary conditions (e.g., functional mobility issues, joint/muscle pain, fatigue, chronic pain, arthritis, depression, etc.) for those living with mobility impairments (Ravesloot et al., 2005). The Living Well program was designed for delivery within a community-based independent living center. Incorporating behavioral theory, the program curriculum consisted of 10 chapters that addressed goal setting, problem solving, attribution training, depression, communication, information seeking, nutrition, physical activity, advocacy and maintenance. Upon evaluation of the program, it was found that participants reported less limitation from secondary conditions, fewer unhealthy days, and less health care utilization (e.g., hospitalization, medications) equating to a cost savings of $807 per person. The reduction in limitations attributed to secondary conditions lasted 12 months postintervention and reports of more “healthy days” and less health care utilization lasted 4 months postintervention. The results of the Living Well with Disability program serve as a research resource for future interventions that promote the health of IWD.
Rimmer et al. (2000) examined the effects of a 12 week health promotion intervention targeting a population of 35 predominantly African American stroke survivors. At the time, the authors noted that this was the only HPP that evaluated the efficacy of a three-component health model (exercise, nutrition, and health behavior) on specific psychological and physiological health outcomes (i.e., lipid profile, peak oxygen uptake, strength, flexibility, body composition, PA, dietary fat intake, life satisfaction, and depression). The intervention was delivered 3 days a week for 12 weeks and included sessions on: fitness instruction and exercise, nutrition education, and health behavior changes. In developing the intervention, health promotion developers removed the barriers (i.e., cost of a program, lack of transportation, lack of energy, lack of a site in which to exercise) that African American women with disabilities faced in context to PA. Once the barriers were removed, participants participated in (a) a comprehensive exercise program (i.e., aerobic, strength, and flexibility), (b) nutrition classes held for 1 hour 3 days a week, and (c) health behavior classes held 2-3 times a week for 60-90 minute durations aimed at addressing secondary conditions related to stroke. Results indicated that participants who completed the program obtained significant gains in health outcomes (i.e., reduced total cholesterol, reduced weight, increased cardiovascular fitness, increased strength, increased flexibility, increased life satisfaction and ability to manage self-care needs, decreased social isolation). Results indicate that short-term health promotion interventions inclusive of PA are an effective way to improve physiological and psychological health outcomes.

Stuifbergen and colleagues investigated the effects of a wellness intervention targeted to a convenience sample of 113 women with multiple sclerosis (MS) (Stuifbergen et al., 2003). The intervention program was integrated into 2 phases: an educational and skill-building lifestyle change program phase and a supportive telephone follow-up phase. The lifestyle change program
consisted of 8 weekly sessions lasting 90 minutes in duration. Topics covered included: How to maximize health when living with a disability; Exercise and PA for fun; Endurance and strength; Healthy eating; Stress management; Intimacy and sexuality; and Women’s health issues. Telephone follow-up calls were held bimonthly by an intervention facilitator who acknowledged accomplishments and encouraged the continued pursuit of individual goals. Behavioral strategies (i.e., establishing goals, addressing barriers, increasing self-efficacy) and dissemination of information pertinent to health promotion were used in shaping the program. Results denoted improvements in self-efficacy, health behaviors, and two components of quality of life (QOL) (i.e., bodily pain and mental health). Thus, this study strengthened the on-going research that supports the efficacy of HPP to improve health within the population living with disability.

Abdullah and colleagues developed and delivered a HPP intervention (Healthy Lifestyles program) curriculum targeting people with various disabilities (Abdullah et al., 2004). The objective of the intervention was to empower individuals with disabilities that were susceptible to compromised health status and developing secondary conditions. The content of the Healthy Lifestyles program was formatted into 2.5 workshop days that included informational sessions on physical, social, emotional, and spiritual health, as well as PA activities such as yoga and non-impact aerobics. Behavioral strategies (i.e., goal-setting and ways to overcome barriers) were included within the group sessions that were held 6-9 months postworkshop. One unique aspect of the program was the inclusion of at least one trainer living with a disability, who served as a workshop leader and mentor. Results of the Healthy Living program showed early and sustained improvements in health outcome measures, which offers an additional approach to promoting health for IWD.

In a study targeting women with disabilities, Hughes et al. (2003) pilot-tested a health
promotion intervention (CROWD; Center for Research on Women with Disabilities) targeting women with physical disabilities. The program consisted of a 7 week (one session per week) workshop grounded in SCT that addressed health outcomes (i.e., self-efficacy of diet, PA, participation, decision-making, physical functioning, bodily pain, social functioning, mental health). Each session lasted 2 hours and was delivered at either a rehabilitation research center or a multiservice center for IWD. Each session included (a) feedback and problem-solving exercises related to participants’ goals from previous weeks; (b) presentations on two topics (i.e., goal-setting, benefits, strategies, and guidelines of PA, understanding emotional wellness, facts about depression, personal rights and safety for women with disabilities, nutrition, etc.); and (c) group discussions relating to topics presented. Two women with disabilities received training to serve as workshop facilitators. Postintervention telephone calls were made to evaluate the satisfaction with the program, and results show that most women reported that the workshop exceeded their expectations and increased their confidence in managing disability. A significant difference existed between the preintervention and postintervention questionnaires (i.e., self-efficacy for diet, medical decision making, social interaction, physical functioning, role limitations due to physical problems, and vitality) indicating that the CROWD intervention was beneficial to improving health outcomes for women with disabilities.

Research continues to explore the efficacy of PA-centered HPP whose objectives include improving health outcomes and preventing secondary/chronic conditions for IWD. Consequently, public health officials and emerging rehabilitation scientists have begun to take a vested interest in evaluating the effectiveness of HPP interventions (Rimmer et al., 2010) such as the ones reviewed. However, in the face of the emerging efforts to implement interventions that support positive health outcomes (e.g., pain/fatigue reduction, improved cardiorespiratory health,
increased strength, etc.), no programs exist for patients with a brain injury. With this gap in services, an opportunity exists to develop, deliver, and evaluate a physical activity-centered education intervention for brain injury.

Preliminary Research for PACE Development

The first step in developing a HPP is to target a specific population, and subsequently, create an audience profile. By identifying the needs of a specific segment of the population, program designers can better match the intervention program components to the needs of the program recipients (USHHS Guide to Community Action). Thus, with the appropriate pairing of participant needs to program material, a well-designed program will increase the likelihood of participant adherence as well as the efficacy of the program. To create the audience profile for individuals with brain injury, several studies were utilized to identify the (a) target population, (b) current level of PA or intention to become involved in PA, (c) current beliefs and attitudes in context to PA, (d) gaps in services provided, (e) gaps in knowledge of the impact of PA on health and rehabilitation outcomes, and (f) barriers to PA participation. By gathering this information, program designers can match the needs of the participants to the goals of the health program.

To assess current PA knowledge, intention to participate, and common barriers and motivations to PA, a series of focus-group interviews was conducted, utilizing patients from a brain injury inpatient rehabilitation facility (Self, Driver, & Stevens, 2011). During the focus-group interviews, participants discussed a series of questions related to their knowledge, motivation, and barriers faced in context to PA participation. Answers to the questions were recorded and transcribed. Analysis of the transcribed material focused on identifying gaps in knowledge relating to PA. Common misconceptions of PA included (a) health benefits
associated with PA, (b) the amount of PA necessary to experience health benefits, (c) the difference between PA and physical therapy, and (d) the role of PA on rehabilitation outcomes. From these results, the PACE program development team identified key gaps in knowledge in context to PA participation and benefits. Results supported the importance of including an educational component within HPP.

A key component to any HPP targeting IWD is the identification of barriers to the person’s environment and individual’s ability to participate in healthy behaviors (Rimmer & Rowland, 2007). Once barriers are identified, HPP developers implement behavioral strategies to help participants overcome these barriers. Thus, research to identify barriers for individuals with a brain injury was a crucial, preliminary step in the development of PACE. Driver (2009) examined the barriers to PA faced by 192 outpatients with traumatic brain injury (TBI). A purposive sampling of TBI patients from an outpatient rehabilitation program (i.e., 47 months since injury) completed a short survey which included information on age, gender, time since injury, level of cognitive functioning, level of physical ability (e.g., walker, cane, wheelchair), level of PA post injury, barriers to PA participation, and interest in starting a PA program. Results indicated that (a) participants were highly motivated to exercise, (b) 84% of the sample indicated they wanted to start an activity program if one was provided, (c) individuals felt it was “very important” to be good at PA, and (d) participants identified, on average, 6 common barriers to participation. Barriers identified were (a) lack of assistance to help with PA (48%), (b) exercise would make the condition worse (42%), (c) lack of transportation (40%), (d) exercise would not benefit condition (46%), (e) cost of an exercise program (38%), and (f) lack of an accessible facility (19%). These results also indicated that participants were completing insufficient PA (i.e., 46 minutes) despite possessing a strong desire to be physically active. The
lack of PA was attributed to inability to overcome the significant number of barriers reported by participants. Again, results identified the type of barriers faced by outpatients and consequently, HPP developers can use this valuable information to integrate strategies to overcome these barriers within future health promotion programs.

Further information used in the development of PACE was taken from a study conducted by Driver and colleagues (Driver, Ede, Dodd, Warren, & Stevens, 2011). The study investigated self-reported PA level, barriers to PA participation, importance placed on PA, and readiness to be active in 28 individuals with a recent TBI (i.e., 43 days prior to testing) enrolled in an extensive rehabilitation outpatient program ($M$ age$= 44.11$, $SD = 16.23$). Results indicated that participants described themselves as being in the “action” stage of PA behavior despite only completing an average of 46 minutes of PA per week. According to the U.S. guidelines for PA, individuals in the “action” stage should accumulate of 150 minutes of moderate PA weekly. This lack of understanding that 46 minutes of PA does not meet the recommended guidelines provides an opportunity for PACE program developers to educate participants about the nationally-recommended amount of PA necessary to achieve healthy benefits. Participants of the study also reported an average of 2.25 out of nine possible barriers. The disproportionate reporting of barriers between the two study groups (i.e., 43 days vs. 47 months postinjury: Driver, 2009) may be attributed to the length of time postinjury. Participants who are 43 days postinjury were still enrolled in the comprehensive outpatient program which provides a multi-disciplinary support system for patients. These patients may have reported fewer barriers due the supportive nature of the clinical environment versus the home, school, or work environment experienced by the 47 months postinjury participants. However, results indicated that 85.7% of participants believed
that PA was important, and 73% reported a desire to enroll in PA program. Results support the conclusion that if a PA program is available, patients with TBI would participate.

Outcomes from previous studies indicate that individuals with a brain injury are (a) willing to participate in a PA program if available, (b) lack knowledge about the benefits of PA and PA guidelines, and (c) unaware of the number of barriers to be faced postdischarge. The results provide valuable information for health promotion development targeting individuals with brain injury.

In summary, research has demonstrated that integrating PA into health promotion programs (HPPs) can result in positive health outcomes (i.e., management of associated, and/or prevention of secondary and chronic conditions; Lollar & Crews, 2003; Rimmer & Rowland, 2008) and positive rehabilitation outcomes (i.e., abilities, adjustment, participation, increased amount of consistent PA completed) for IWD (Hughes et al., 2003; Ravesloot et al., 2005; Friedman, et al., 1997). Despite the fact that HPPs that incorporate PA have shown success in clinically-based settings for IWD and that PA has been shown to be an effective mode of rehabilitation for IWD, no such HPP (inclusive of PA component) exist for patients with a brain injury. Therefore, the objective of this study is to develop a PA-centered education program (PACE) aimed at meeting the health needs for individuals with brain injury enrolled in a comprehensive outpatient rehabilitation center.

PACE Aims and Hypotheses

Primary Aim 1: To increase the self-efficacy for being physically active for participants in the PACE program

Hypothesis 1: After completion of the PACE program, participants will report increased self-efficacy for PA behavior.
Hypothesis 2: Participants in the PACE program will report greater self-efficacy for physical activity than the standard of care group.

Primary Aim 2: To increase readiness to be physically active of participants in the PACE program.

Hypothesis 1: After completion of the PACE program, participants will report an increase in readiness to be physically active.

Hypothesis 2: Participants in the PACE program will report greater readiness to be physically active than the standard of care group.

Primary Aim 3: To improve the rehabilitation outcomes (i.e., abilities, participation, adjustment) of participants in the PACE program.

Hypothesis 1: After completion of the PACE program, participants will report improved rehabilitation outcomes.

Hypothesis 2: Participants in the PACE program will report greater rehabilitation outcomes than the standard of care group.
METHODOLOGY

Participants

Participants with a brain injury were recruited from a comprehensive outpatient rehabilitation program at a local rehabilitation center. The outpatient program implements a multi-disciplinary approach to rehabilitation (i.e., provides traditional rehabilitation care such as physical, occupational and speech therapy as well as non-traditional services such as driving instruction, aquatics therapy, and home-based care) between the hours of 9 am and 3 pm Monday through Friday. The objective of the program is to provide comprehensive care that assists patients with the successful re-integration back into their home, community, and work environments.

Patients enrolled in the comprehensive outpatient program were targeted for several reasons. First, these patients do not receive formal education regarding the role of PA in the rehabilitation process or health outcomes (i.e., fewer sick days, reduced risk for chronic diseases such as Type 2 diabetes, high-blood pressure, cardiovascular disease, etc.). Second, the outpatient program serves as the interim stage between inpatient rehabilitation and the re-entrance into the school, work, and/or home environments. During this stage of rehabilitation, patients learn strategies for overcoming barriers to participation that they may face when transitioning back to an environment that lacks both the immediate availability and support of therapists and medical staff. Third, the outpatient program was considered an appropriate environment for the PACE program as patients are already familiar with similarly structured educational sessions (e.g., 1 hour long, group discussion following presentation of information, handouts). Finally, patients enrolled in the outpatient program function at a higher cognitive level than those patients enrolled in the inpatient program due to a variety of medical factors
(e.g., decrease in brain swelling, medication, improved recovery). As a result, higher functioning patients are more likely to: engage in meaningful discussions about barriers faced to being physically active, understand the implications of being active/inactive for their current and long-term rehabilitation, and initiate their own strategies to overcome barriers to PA participation. For these reasons, the comprehensive outpatient program was considered an appropriate environment to implement the PACE program.

A convenience sample was utilized with multiple inclusion and exclusion criteria. Inclusion criteria included (a) female or male, (b) aged 18 to 63, (c) first-time brain injury, (d) undergoing comprehensive outpatient rehabilitation, (e) high cognitive functioning, and (f) absence of orthopedic or medical impairments that contraindicate PA participation. Exclusion criteria included (a) aged younger than 18 years or older than 63 years, (b) severe cognitive impairment, and (c) premorbid mental illness and/or premorbid developmental disability. Cognitive functioning was determined by a multidisciplinary team including a neuropsychologist, an occupational therapist, a physical therapist, a speech/ language pathologist, a recreational therapist, and the director of the outpatient program. Recommendation for entrance into the PACE program was based on the team’s direct observations and written evaluations of each patient during their time spent within the inpatient program.

Procedure

Prior to enrolling patients in the study, the Institutional Review Board at a local medical center and at an academic institute granted human subjects approval, guaranteeing that all procedures were approved ethically. The present study included both a PACE participant group and a standard of care group.
The PACE group, comprised of patients who met the inclusion criteria for the PACE program, were consented immediately upon enrollment into the outpatient program and were familiarized with the purpose and requirements of the study. Immediately following consent, participants completed the pretest assessment with a research assistant who was not involved with the delivery of the PACE program content. The PACE group participated in both the standard outpatient program and the PACE program. The PACE program ran for eight weeks and included two, one hour sessions delivered Mondays and Fridays at 11am (16 total sessions). Based on the recommendations of counselors and staff at the rehabilitation center, participants were placed into groups of 4-8. This number, when feasible, allowed for meaningful discussions without overwhelming patients placed in groups larger than 8 people. Posttest assessments were conducted upon discharge from the outpatient program during a scheduled 15 minute appointment with a research assistant not involved in the delivery of the PACE program. Once participants completed posttest questionnaires, they were discharged from PACE with their informational binder, which included detailed information about program topics and resource materials. Follow-up assessments were completed at 3-months post discharge and consisted of a telephone/email assessment (i.e., same assessment questionnaires used in preentrance and postentrance into the outpatient program). The 3-month follow-up assessments were conducted by a research assistant that delivered the PACE program curriculum.

The standard of care group was comprised of patients who met the inclusion criteria for the study and who completed the standard outpatient program but not the PACE program. Participants for both the PACE and standard of care groups were evaluated by the same multi-disciplinary team of clinical therapists (i.e., occupational, physical, recreational, and speech) and clinical specialists (i.e., board certified physicians and clinical neuropsychologists). This multi-
disciplinary team deemed potential participants as “able” physically, psychologically, and socially to participate in the group setting of the PACE program. This standardized approval process was necessary to ensure equitable populations for both the PACE and standard of care groups.

A comparison group was utilized as an additional reference in assessing the rehabilitation outcome differences between the PACE and standard of care groups. The comparison group consisted of patients (based on same inclusion and exclusion criteria as the study group) who were enrolled in the comprehensive outpatient program during 2008. Patients in the comparison group were provided with the same rehabilitation services as the PACE and standard of care groups with the exception of the PACE program.

Although deemed “able” by the multidisciplinary team, the control group did not participate in the PACE program. Like the experimental group, the control group participants were consented immediately upon enrollment (and following the standardized approval process) into the outpatient program and were familiarized with the purpose and requirements of the study. Following consent, participants completed the same pretest and posttest questionnaires as the experimental group. Questionnaires were administered, on an individual basis, by a research assistant that delivered the PACE program during a scheduled 15-minute time frame.

Clinical Issues

Two clinical issues arose with the integration of the PACE program into the standard outpatient program. The first issue was the variable length of stay of patients. Average length of stay for the outpatient program is 8.5 weeks. However, due to disparate insurance coverage, program entrance dates, and rate of recovery, patients entered and exited the outpatient program
at different times. As a result, some participants completed the full eight-week PACE program while others completed only a portion of the program; some patients joined the PACE program for the first session while others began their PACE experience during subsequent sessions. This is an issue faced by all programs within comprehensive rehabilitation due to the ongoing and complex nature of brain injury recovery. To address this clinical issue, the PACE program was designed around inter-connected topics that could be presented in a non-linear fashion. In addition, the introduction to each session included a comprehensive review of subsequent and previous topics. This review period served as a content reminder for current PACE enrollees, as well as, a content introduction for new enrollees.

The second clinical challenge involved the unpredictable and fluctuating enrollment numbers of brain injury outpatient participants. Due to the cyclical rise and fall of enrollment numbers, coupled with the desire to not withhold a potentially beneficial program from patients, the decision was made to run the experimental and control groups at different times. This decision was based upon the model of a proportionate mortality or morbidity study within epidemiology (Stone, Armstrong, Marcina, & Pankau, 1996). This method is used in research when it is not feasible to find control participants because of clinical factors (e.g., ethical issues related to withholding a potentially beneficial intervention from patients, insufficient amount of patients for a study and control group to occur simultaneously). In order to provide a means of comparison, a given measure in the experimental group is compared with the same measure (e.g., resulting from the same questionnaire) in a reference population (e.g., patients not receiving PACE program delivery). This strategy increases the likelihood that the measures are proportionate (equal).
PACE Development

After reviewing the literature of successful PA education-based interventions, key behavioral strategies were identified as variables of interest for the PACE program. Thus, following the literature review, the PACE program incorporated four behavioral strategies to facilitate the adoption and maintenance of PA behaviors which included (a) goal setting and tracking progress toward goals; (b) creating social support for emerging, intermediate, and established PA behaviors; (c) employing self-rewards to reinforce and motivate PA behaviors; and (d) using problem solving strategies to overcome individual barriers to PA behavior adoption and maintenance (Gillis et al., Huges et al., 2003; 2003; Ravesloot et al., 2007; Rimmer et al., 2000; Stuifbergen et al., 2003). In addition to reviewing the behavioral components of various education-based PA interventions, the PACE development team followed the suggested guidelines for the development/implementation of HPP detailed in the USDHHS health promotion guide (USDHHS: Promoting Physical Activity).

Utilizing the standardized HPP design process, the curriculum for the PACE program was formatted to adhere to the outpatient program’s established method of information delivery. Adhering to this established format, each session began with a comprehensive review of previous sessions followed by the introduction and delivery of a new topic. Introduction of new topics utilized multiple modes of delivery including: short information sessions, visual aids (e.g., interactive worksheets, diagrams, related streamed video clips), educational games (e.g., matching, fill in the blank activities, bingo), and printed materials (e.g., student worksheets covering topic outlines, goal-setting worksheets, research articles, behavior tracking worksheets, etc.). Following topic delivery, instructors facilitated group discussions relating to each session’s specific topic (see Table 3). The only deviation from the established method of information
delivery was the implementation of behavioral strategy application (i.e., group reviews of current PA goals, barriers faced, and strategies to overcome those barriers; see Table 4). This content addition occurred toward the end of each session and served as an opportunity for instructors to assess participant’s individual progress and comprehension of study objectives (i.e., amount of weekly PA completed, level of self-efficacy for PA, intention to be active, and current rehabilitation outcomes).

Table 3

PACE Topics and Session Sequence

<table>
<thead>
<tr>
<th>PACE Topics</th>
<th>Session Sequence</th>
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<tbody>
<tr>
<td>PA guidelines, definitions, and benefits consequence of inactivity</td>
<td>Week 1</td>
</tr>
<tr>
<td>Exercise is medicine for general public and brain injury</td>
<td>Week 2</td>
</tr>
<tr>
<td>Goal setting, motivations, and rewards</td>
<td>Week 3</td>
</tr>
<tr>
<td>Identifying stages of change</td>
<td>Week 4</td>
</tr>
<tr>
<td>Overcoming barriers and detours to PA</td>
<td>Week 5</td>
</tr>
<tr>
<td>Building social support</td>
<td>Week 6</td>
</tr>
<tr>
<td>Resources for PA</td>
<td>Week 7</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Week 8</td>
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</tbody>
</table>

Table 4

Components of a PA Intervention (USDHHS, 2008)

<table>
<thead>
<tr>
<th>Intervention Components</th>
<th>Reason Included</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing knowledge of the importance of PA</td>
<td>Demonstrates importance of the issue to participants – increases likelihood that they will pay attention to information and seriously consider behavior change</td>
<td>Relationship to rehabilitation, healthy lifestyle, etc.</td>
</tr>
<tr>
<td>Dispelling misconceptions about PA</td>
<td>Aids in breaking down some common barriers that may prevent individuals from becoming active</td>
<td>“Exercise isn’t fun, it’s hard work”, “I could easily hurt myself participating in PA, so it’s not worth it”</td>
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Table 4 (continued).

<table>
<thead>
<tr>
<th>Intervention Components</th>
<th>Reason Included</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing supportive social networks</td>
<td>Teaches individuals to analyze their social influences (positive and negative) and recognize relationships that may aid in achieving PA goals</td>
<td>Use a buddy system for encouragement, involve significant others in goal setting, etc.</td>
</tr>
<tr>
<td>Enhancing motivation to participate</td>
<td>Motivation is the factor that determines whether or not an individual will actually follow through with a desired behavior</td>
<td>Recommend personal goals that relate to the lifestyle and values of each participant, involve a spokesperson that the target audience can identify with and trust, etc.</td>
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<tr>
<td>Overcoming barriers in physical environment</td>
<td>Aids in breaking down some common barriers that may prevent individuals from becoming active</td>
<td>Provide a list of well-lit safe walking paths in the community, provide transportation to accessible facilities, etc.</td>
</tr>
<tr>
<td>Increasing readiness to change</td>
<td>Assessing individuals’ readiness to change helps instructors individualize the information presented</td>
<td>Assess current stage of change, provide strategies needed to progress through the stages</td>
</tr>
<tr>
<td>Teaching and practicing skills to initiate and maintain new behaviors</td>
<td>Equips individuals to move into and remain in the maintenance phase after leaving the PACE program</td>
<td>Develop a list of resources in the community, incorporate “how-to” materials and videos, etc.</td>
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PACE Pilot Work

Curriculum and materials for the PACE program were pretested with a group of 8 participants that met the inclusion criteria for the study and were deemed “able” to participate in the pilot study group setting. A multi-disciplinary team of therapists and clinical rehabilitation staff selected pilot group members. The decision to run a pilot group was made to address several potential issues. First, several PACE sessions were delivered out of sequence (i.e., session 5 delivered before Session 3 from the intentioned PACE delivery plan (i.e., to be
executed with actual experimental group) to anticipate the challenges of variable patient enrollment. Second, the research team sought to ensure that PACE materials were applicable and appropriate to address the rehabilitation needs of the study participants. Following each pilot session, participants were asked for verbal feedback regarding: (a) clarity/readability of material, (b) length of the session, (c) mode of delivery for the session, (d) applicability of the session to current rehabilitation objectives (i.e., will the presented PA material assist with the participant’s outpatient rehabilitation?), and (e) personal level of engagement in context to delivery of session material (i.e., did participants perceive the session as enjoyable). Finally, researchers evaluated whether the amount of material included in each session met the one hour time objective (i.e., enough/not enough material to fill a 1-hour session).

The pilot phase ran for three weeks (December 2010) at the comprehensive outpatient center and covered six sessions of PACE. The sessions were delivered in the following sequence: Session 1 (PA definitions and guidelines part 1), Session 2 (PA definitions and guidelines part 2), Session 5 (goal setting), Session 7 (behavior change), Session 3 (exercise is medicine for general population), and Session 4 (exercise is medicine for brain injury).

Generally, the participants that volunteered feedback, gave positive/complimentary commentary regarding all aspects of the PACE program (e.g., enjoyed the welcoming/friendly demeanor of PACE instructors, interactive games, discussions, and colorful format of worksheet pages). Several participants expressed disappointment that they would not be involved in the full 16 session delivery of the PACE program. In addition to in-class verbal feedback, the clinical therapists that facilitated the discharge process stated that participants listed PACE as one of their favorite rehabilitation experiences. All feedback received from the participants and therapists indicated that the actual study would yield similar results.
Measures

Initial demographic data were collected for each participant (e.g., race/ethnicity, age, gender, years of education, income, occupation, marital status, family status, etc.) in an effort to understand the participants’ defining characteristics (see Appendix C for details). Staff from the rehabilitation center collected additional data that was recorded as part of the normal patient program and included the Functional Independence Measure (Wright, 2000) and the Glasgow Coma Scale (Teasdale & Jennett, 1974).

The questionnaires administered at pre-PACE and post-PACE program assessed psychosocial variables (i.e., self-efficacy, readiness) and rehabilitation outcomes (e.g., abilities, participation, and adjustment) (see Table 5).

Questionnaires administered at the 3 month follow-up time frame, assessed psychosocial variables (i.e., self-efficacy, readiness) and rehabilitation outcomes (e.g., abilities, participation, and adjustment) (see Table 5).

Table 5

PACE Study Measurements

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<td>Pretest questionnaires</td>
<td>Demographic data</td>
<td>Demographic data</td>
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<td>PA Self-efficacy</td>
<td>PA Self-efficacy</td>
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<td>Exercise stage of change</td>
<td>Exercise stage of change</td>
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<td></td>
<td>MPAI-4</td>
<td>MPAI-4</td>
<td>MPAI-4</td>
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<tr>
<td>Posttest questionnaires</td>
<td>Demographic data</td>
<td>Demographic data</td>
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<td></td>
<td>PA Self-efficacy</td>
<td>PA Self-efficacy</td>
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<td>MPAI-4</td>
<td>MPAI-4</td>
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<tr>
<td>3 month follow-up</td>
<td>PA Self-efficacy</td>
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<td>Exercise stage of change</td>
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<td></td>
<td>MPAI-4</td>
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The Exercise Self-Efficacy Scale was used to measure an individual’s confidence in
his/her ability to engage in PA in the face of barriers (Marcus, Selby, Niaura, & Rossi, 1992). It is composed of six items assessing an individual’s self-efficacy to be active when faced with barriers including (1) negative affect (i.e., “I am under a lot of stress”), (2) excuse making (i.e., “I feel I don’t have the time”), (3) must exercise alone (i.e., “I have to exercise alone”), (4) inconvenient to exercise (i.e., “I don’t have access to exercise equipment”), (5) resistance from others (i.e., “I am spending time with friends or family who do not exercise”), and (6) bad weather (i.e., “It’s raining or snowing”). The scale is scored using a 5-point Likert scale ranging from 1 (not at all confident) to 5 (completely confident). High scores indicate an individual is very confident in his/her ability to engage in PA despite barriers, while low scores indicate low confidence. Test-retest reliability for this scale has been reported as .90 over a two-week period, demonstrating stability of the measure over time (Marcus et al., 1992).

The Exercise Stages of Change Scale identifies an individual’s current readiness to be active (i.e., precontemplation, contemplation, preparation, action, or maintenance) (Marcus et al., 1992). Participants are presented with a description of regular exercise (i.e. activity performed three to five times per week for 20-60 minutes per session that causes an increase in breathing rate and sweating) and are asked to choose from five responses related to their level of engagement which represent a stage of change. Precontemplation refers to individuals who are not active and do not intend to become active in the foreseeable future (i.e., “No, and I do NOT intend to in the next six months”). Contemplation refers to individuals who are considering becoming active but have not acted on their thoughts (i.e., “No, but I intend to in the next six months”). Preparation refers to individuals who occasionally exercise but not on a regular basis, or those who do not exercise but intend to start soon (i.e., “No, but I intend to in the next 30 days”). Action refers to individuals who have been consistently meeting the guidelines specified
for exercise for six months or less (i.e., “Yes, I have been for 6 months or less”). Maintenance refers to individuals who have been consistently meeting the guidelines specified for exercise for more than six months (i.e., “Yes, I have been for more than 6 months”). Participants are asked to select one statement that most accurately portrays their exercise habits. The kappa index of reliability for this scale has been reported as .78 for a 2-week period (Marcus et al., 1992) and has been used with adults with brain injury (Driver, Ede, Dodd, Stevens & Warren, 2011).

The Mayo Portland Adaptability Inventory – 4 (MPAI-4) is a common clinical measure used after brain injury to describe an individual’s rehabilitation outcomes in terms of functional independence (Malec, 2005b). The inventory is composed of three subscales including (a) abilities, (b) adjustment, and (c) participation. The abilities subscale consists of 12 items (e.g., mobility, vision, verbal communication, etc.) that assess an individual’s motor, sensory, and cognitive abilities. These items are rated using a 5-point Likert scale ranging from 0 (None) to 4 (Severe problem; interferes with activities more than 75% of the time). The adjustment subscale consists of nine items (e.g., anxiety, fatigue, impaired self-awareness, etc.) that assess an individual’s ability to adjust to a normal routine after brain injury. These items are rated using the same Likert scale described above with the exception of the ninth item. This item is rated using a 5-point Likert scale ranging from 0 (Normal stress within family or other close network of relationships) to 4 (Severe stress that interferes with family functioning more than 75% of the time). The participation subscale includes nine items (e.g., initiation, leisure and recreation activities, transportation, etc.) that assess an individual’s family and social relationships, community involvement, and capability to care for oneself. Each of these nine items is rated using a 5-point Likert scale ranging from 0 to 4 with individual definitions for each item. Scores from all three subscales of the MPAI-4 are added and the total score is used, with a score below
30 representing good functioning, scores between 30-40 representing mild limitation, between 40-50 indicating moderate limitation, 50-60 moderate to severe limitation, and scores over 60 representing severe limitation. Interclass reliability for the MPAI-4 has been reported as .88 and item reliability as .99, both of which demonstrate acceptable reliability (Malec, 2005a).

Data Analysis

The data analysis consisted of several steps, including (1) descriptive analyses, (2) effect size (Cohen, 1988) to determine the strength of the relationship between the pretest, posttest, and 3 month follow-up data of the participant’s rehabilitation outcomes (i.e., abilities, adjustment, participation) for the PACE and standard of care groups (3) effect size (Cohen, 1988) to determine the strength of the relationship between the pretest, posttest, and 3 month follow-up data of the participants’ exercise self-efficacy and stages of change for PACE and standard of care groups, (4) percent change between the pretest, posttest, and 3 month follow-up of each variable in the PACE and standard of care groups, and a (5) Z test (Chernoff & Lehmann, 1954) to determine significance of observed stage of change data between the PACE and standard of care groups. The statistical analysis was completed using both Microsoft Excel software (MS Office 2010) for Windows and the Statistical Package for Social Sciences (SPSS 19.0.3) for Windows (SPSS Inc., 2010). Calculating effect size (ES) is a means of determining the statistical meaningfulness of data when the sample size is small (Cohen, 1990; Cohen, 1994). An ES of .20 or less is a small ES and indicates that .20 or less of a standard deviation separates the mean of the pretest and posttest (Cohen, 1988). An ES = .50 is considered moderate, and an ES of .80 or greater is a large ES (Cohen, 1988). A Z test was used to assess whether the paired
observations on two variables, expressed in a contingency table, are independent of each other. A value of $p < .05$ indicates a significant difference between the paired observations.
RESULTS

Means and standard deviations for demographic data collected during pretesting can be found in Tables 6 and 7. For the intervention group, 23 patients in the comprehensive rehabilitation program were eligible for participation, one of which declined to consent. Participants who completed the PACE program \(N = 22; \text{male} = 14; \text{female} = 8\) were an average of 48.68 years old \((SD = 14.05 \text{ years}; \min = 20 \text{ years}; \max = 64 \text{ years})\), with half reporting their race to be Caucasian (50%), and the other half of the group reporting Black (18%), Hispanic (18%), Asian (9%), and Other (5%) ethnicities (See Table 6 for more information on PACE group participants). For the standard of care group, 11 patients in the comprehensive rehabilitation program were eligible for participation, one of which was terminated from the outpatient rehabilitation program for lack of adherence to the attendance standard. Participants in the standard of care group \(N = 10; \text{male} = 7; \text{female} = 3\) were an average of 37.3 years old \((SD = 14.42; \min = 19 \text{ years}; \max = 65 \text{ years})\), with the group reporting a comparatively even distribution between Caucasian (30%), Black (30%), and Hispanic (40%) ethnicities (See Table 7 for more information on standard of care group participants).

Rehabilitation outcomes (i.e., abilities, adjustment, participation) were measured with the MPAI-4 and total scores for PACE participants decreased an average of 14.35 points from 45.40 (moderate limitation) to 31.05 (mild limitation). Rehabilitation outcomes for patients in the standard of care group decreased an average of 6.18 points from 44.74 (moderate limitation) to 38.56 (mild limitation) and a 2008 comparison group (i.e., 2008 MPAI-4 data pulled from the outpatient center’s database for patients with brain injury that met the inclusion/exclusion criteria for the study) decreased 8.84 points from 42.98 (moderate limitation) to 34.13 (mild limitation). PACE participants demonstrated decreases in scores comparable to the standard of care group.
and the 2008 comparison group from pretesting to posttesting for every subscale of the MPAI-4 questionnaire (see Tables 10 and 11).

PACE participants’ exercise self-efficacy increased an average of 19.36% from pretesting to posttesting (effect size [ES] = 0.37) and maintained a positive average increase of 8.62% from pretesting to the three month follow-up. The greatest increase in self-efficacy from pretesting to posttesting occurred for the item of excuse making (55.93% increase), followed by weather (26.67% increase), resistance from others (12.61% increase), inconvenient (12.20% increase), negative affect (5.36% increase), and exercising alone (3.37% decrease) (see Table 12). The greatest increase in self-efficacy from pretesting to the three month follow-up occurred for the item of excuse making (28.64%), followed by negative affect (13.54%), resistance from others (13.38%), and inconvenient (12.20%). A decrease in self-efficacy occurred for the exercising alone item (-6.97%) and weather item (-9.09%).

The standard of care participants’ exercise self-efficacy decreased an average of 5.02% from pretesting to posttesting (effect size [ES] = -.20). The greatest decline in self-efficacy from pretesting to posttesting occurred for the item of resistance from others item (25%), followed by the weather (18.75%), and exercise alone items (2.56%). There was no change in the average subscale mean total for the negative affect item (0%). Increases for self-efficacy were reported for the inconvenient item (9.29%) and the excuse making item (6.9%).

For the stage of change measure, 14 of 22 PACE participants (63.63%) reported an increase in their readiness to be PA (i.e., progressed forward through the stages of change) (i.e. precontemplation, contemplation, preparation, action, and maintenance) or maintenance of regular PA behavior (i.e., placed in action or maintenance stage) from pretest to posttest. Six PACE participants (27.3%) reported a decrease in their readiness to be PA (either moved
backward one stage or maintained an inadequate level of PA; reported preparation, contemplation, or precontemplation stage; see Table 14). Posttest data for stage of change was not recorded for one PACE participant. Of the 10 PACE participants that reported 3 month follow-up data, eight PACE participants reported maintaining an adequate level of PA (reported action or maintenance stage) from posttest to follow-up, while two PACE participants reported an inadequate level of activity (reported preparation, contemplation, or precontemplation stage) (see Table 14).

Results (from pretest to posttest) for the standard of care group stage of change are as follows: 3 standard of care participants (30%) progressed forward in the intention to be PA (stage of change measurement) to an adequate level of PA, and 7 (70%) of participants either reported a decrease in the intention to be PA (moved in backward direction for stage of change to an inadequate level of PA) or maintained and inadequate level of PA (reported preparation, contemplation, or precontemplation stage; see Table 15). A Z test was calculated to detect significance in the difference between the readiness to change results between the PACE and standard of care groups from pre-test to posttest. The results (3.1; \( p < .05 \)) of the Z test show a significant difference in the total number of PACE participants (14 of 22) that reported an adequate level of PA and the total number of standard of care participants that reported an adequate level of PA (3 of 10; see Table 16).

The amount and intensity of PA measure was not scored correctly on participants’ initial and final tests due to incorrect completion of the questionnaires. This measure has been used previously without error, suggesting that the delivery of information was different in the current study than in previous studies (Driver et al., 2012; Ravesloot et al., 2005; USDHHS, 2001). Participants selected only which type of PA best described their lifestyle instead of indicating the
number of 10-minute bouts of activity completed per week. As a result, this measure was excluded from the study.
DISCUSSION

During the initial planning stages of the PACE program, two objectives were paramount for this project. The primary objective was to create and implement a program for individuals with a recent brain injury and report the results on participants’ rehabilitation outcomes, self-efficacy, and intention to change PA behaviors. The secondary objective was to create and implement a program that would supplement (possibly enhance), not hinder, the existing outpatient program for patients. In respect to these objectives, the PACE program has been shown to have a positive impact on the study variables as collectively, results demonstrated a beneficial effect in helping participants take steps toward adopting regular PA as part of the rehabilitation process.

Measurement Outcomes

Improved Rehabilitation Outcomes

Although the existing outpatient rehabilitation program for brain injury does not currently include a PA education component, patients have access to services such as physical therapy, occupational therapy, recreational therapy, and social work that teach skills to increase their functional independence (Altman, Swick, Parrot, & Malec, 2010). Consequently, rehabilitation outcomes are expected to improve (decrease in MPAI-4 score) after enrollment in the outpatient rehabilitation program. The MPAI-4 data from patients enrolled in 2008, the standard of care group (2012), and the PACE program group (2011-2012) demonstrates this improvement in rehabilitation outcomes (see Tables 10 & 11). The changes in rehabilitation outcomes suggest that PACE, as a supplemental program, may be an effective addition in improving rehabilitation outcomes at discharge. While pilot work for PACE revealed that the largest total mean score
difference (pretest to posttest) in MPAI-4 subscales was the participation scale (Irwin & Driver, 2012), the abilities, adjustment, and participation subscales showed comparatively equal improvement with reported values of 10.95, 10.9, 10.5 respectively. However, high levels of participation are extremely advantageous for patients postbrain injury, as low levels of participation have been linked with a significant reduction in leisure activity participation (Brown, Gordon, & Spielman, 2003; Davies Hallett, Zasler, Maurer, & Cash, 1994; Sloan, Winkler, & Anson, 2007), a greater sedentary lifestyle (Winkler, Unsworth, & Sloan, 2005), and decreased quality of life (Huebner, Johnson, Bennett, & Schneck, 2003). Results indicate that PACE participants left rehabilitation with greater functional ability, greater ability to adjust back to a normal routine, and greater participation in family and social relationships and community involvement than they had before rehabilitation. Similarly, the standard of care participants also benefited from a decrease in all three subscales of abilities, adjustment, and participation. Overall, the group that reported the largest decrease in limitation was the PACE group, suggesting that the PACE program did not disrupt the established standard of care for patients with brain injury. Consequently, the PACE program was effective in increasing positive rehabilitation outcomes for PACE participants.

Improved Self-Efficacy

Previous research has consistently reported that participation in PA has been shown to increase as one’s self-efficacy increases (Haworth, Young, & Thornton, 2009; Reuter et al., 2010). Thus, self-efficacy is considered a crucial component in behavior change, specifically in the adoption and maintenance of PA behaviors (Haworth et al., 2009; Nahas, Goldfine, & Collins, 2003; Reuter et al., 2010). Consistent with these findings, the results from the PACE
study confirmed that the majority of PACE participants who reported increases in exercise self-efficacy (ES = .37) in all six subscales (see Table 12) also reported increases in the intention to be active (from pretest to posttest; see Table 14). The self-efficacy results suggested that PACE participants held a greater belief in their ability to engage in PA after the program than they did before the program (see Table 12). Thus, PACE participants are more likely to successfully strategize how to overcome barriers and engage in regular PA (Bandura, 1986; Haworth et al., 2009; Reuter et al., 2010) once discharged from the outpatient rehabilitation center.

**Declines in Self-Efficacy**

Based on the association between self-efficacy and regular PA, it was imperative to report decreases in self-efficacy as well. Decreases in self-efficacy suggest a reduced perception in the ability to overcome barriers. Thus, with previous research reporting that individuals with brain injuries face numerous barriers to PA when living in the community (Driver, 2005; Driver et al., 2012), results from the three month follow-up data supported this reality. At three months post-PACE program (pretest-3 month follow-up), participants reported decreases in self-efficacy for the exercising alone, weather, and excuse making items. However, even with a reported decrease in self-efficacy on these two items, the self-efficacy results for the PACE group were comparably better than the standard of care group. The standard of care group reported (pretest to posttest) reduced self-efficacy on three items (exercising alone, resistance from other, and weather) and no change for the negative affect item. Thus, the results supported previous research demonstrating that a HPP that includes PA education can result in increased self-efficacy (Stuifbergen et al., 2003). Through the identification of barriers (specific to the
needs of patients with brain injury) and the inclusion of curriculum that teaches patients to overcome these barriers, HPP can better prepare patients for life after discharge.

*Intention to be PA*

In addition to an individual’s self-efficacy, readiness to be physically active influences PA participation. For example, patients in the precontemplation stage would be unlikely to complete PA independently, whereas patients in the action or maintenance stage would complete regular PA participation (Prochaska & DiClemente, 1983). Results from the current study indicated that individuals who completed the PACE program were more likely to participate in regular PA. For example, 14 of 22 PACE participants reported either: (1) a forward progression toward the action/maintenance stage or (2) continuance of an adequate level of PA (i.e., reporting a level of PA constant with being in action or maintenance stage) (see Table 14). Conversely, only 3 of 10 participants from the standard of care group reported either: (1) a forward progression toward the action/maintenance stage or (2) continuance of an adequate level of PA (i.e., reporting a level of PA constant with being in action or maintenance stage) (see Table 15). While moving through the stages of change is an individualized and dynamic process (USDHHS, 1999), these results suggested that PACE was generally successful in supporting the process of moving participants towards regular PA participation. However, as James Prochaska warns (Prochaska & Velicer, 1997), the vast majority of those that progress toward the action stage, return to the contemplation or precontemplation stage during the dynamic process that is behavior change. However, evidence of this forecast was not present at the three month follow up for the PACE group as results showed that only 3 out of the 10 participants (that submitted 3 month follow up data) reported a regression in their exercise stage of change. Of those three
participants, two of them remained at an adequate level of PA (reported action stage). In conclusion, for participants in this study, a HPP that includes education about PA can facilitate positive behavior change and thus, increase participants’ readiness to engage in regular PA.

Interactive Teaching Environment

Presently, the PACE program is the only educational intervention within the outpatient program for brain injury intended to engage participants in an “interactive” (i.e., environment where instructors and participants share information symbiotically) format rather than a “lecture” format. Consequently, with the interactive group environment, participants who previously did not talk or open up in other therapy sessions, became openly engaged in the PACE program. Upon observation of the interactive dynamic of PACE, the director of the program asked to film PACE sessions in order to use the teaching approach as a model for other education-based group meetings. Furthermore, exit interviews held at discharge between the outpatient coordinator and the PACE participants revealed that several of these participants cited PACE as one of their favorite aspects of the outpatient experience. Consequently, with positive reviews from several participants and with the acknowledgement, from therapists, of the importance of PA in the rehabilitation process, the outpatient center intends to continue PACE. Depending on available resources and corporate approval, the outpatient program intends on soliciting help from the multi-disciplinary group of therapists in delivering the PACE curriculum. If feasible, the PACE program, or an adapted version of the program will be integrated into the standard of care.

Future Research

Findings from the present study provide a base for future research to further test the
efficacy of the PACE program within the clinical setting and beyond. Using PACE as a platform, several opportunities exist to extend and strengthen the results.

First, the PACE program or an adapted version of the program should continue to run within the outpatient rehabilitation program in order to: (1) increase the sample size of both participation and standard of care groups, (2) increase internal validity by revising PACE questionnaires to more accurately measure the amount of PA completed, identify established and previously unreported barriers faced, and streamline the pretest, posttest, and follow-up test procedure, and (3) increase external validity by consulting with the outpatient team of therapists on ways to adapt PA to work around physical limitations experienced during the initial stages of rehabilitation.

Sample Size

To increase the sample size of both the PACE and standard of care groups, the length of time for the study will need to increase. It may take one to several years to identify patients that meet the inclusion criteria for the study. In future studies, the total number of subjects in the PACE group should be equal the total number of subjects in the standard of care group. PACE class group size should remain between 4-8 participants, but multiple classes could run during the week. Thus, the class size stays small, but the overall study participant total would increase. Ideally, the initial goal would be to consent and service a minimum of 60 participants (i.e., 30 participants for PACE program and 30 participants for standard of care comparison) in future studies. This number is needed to ensure sufficient power in order to reduce a Type I error, and is based on the number of measures in the study. Once again, to accommodate this condition, the time to run the study will need to increase. Having equal group numbers should also increase the internal validity of the study and will yield for more sophisticated data analysis.
Internal Validity

Along with increasing the sample size, future studies can strengthen results by directing efforts into increasing the internal validity of the study. For example, therapists could work with PACE instructors to ensure a systematic process is followed in capturing rehabilitation outcome, self-efficacy, and intention to be PA data during pretest, posttest, and follow-up test time frames. Since pre and posttest measurements are conducted by individuals who do not deliver the PACE program, the opportunity exists for inter-rater reliability issues. Extensive pilot work for future studies can reduce the possibility of this reliability issue by ensuring that all researchers use the same script when administering questionnaires. Additionally, therapists should work with PACE instructors to ensure that rehabilitation data collected post discharge is calculated correctly.

External Validity

To increase the likelihood that results from the PACE study can be applicable for other outpatient facilities, PACE instructors should consult with the physical, occupational, and recreational therapists on how to adapt PA for patients at the beginning stages of rehabilitation. Although physical and cognitive limitations for brain injury are varied, therapists can provide valuable input on how to adapt PA so that each patient can individually increase the likelihood of participating in regular PA. An additional session that includes this education component can be added to or combined with an existing session of PACE. Rehabilitation facilities across the U.S. may be more open to the program with the inclusion of clinical expertise.

Second, to track the long term efficacy of PACE, follow-up measurements should be collected at 6, 9, and 12 month intervals (postdischarge) for both PACE and standard of care groups. Again, the length of time of the study will need to increase to track long term changes.
Third, an amendment to the PACE program could be the length of the PACE curriculum and the frequency of delivery. For example, the mean length of stay for PACE participants was 5.5 weeks so the majority of individuals were unable to complete the entire curriculum. Modifying the program to run in six weeks would allow more participants to attend the majority of the program. In addition, offering PACE sessions three times per week (instead of biweekly) would shorten the total number of weeks needed to complete all curriculum, and may increase participants’ recall of key information.

Fourth, a follow-up program that begins after participants are discharged from rehabilitation should be created. This program could potentially be based online, and include (a) follow-up questionnaires for 3, 6, and 12 months, (b) chat and blog functions through which former PACE participants could keep in contact with one another, post their successes, their difficulties, and provide and receive social support, (c) an online updated version of PACE materials to use as an on-going reference guide, (d) PACE mentor program reference materials and announcement, and (e) online reference/repository for the latest national guidelines for PA and other applicable PA research and journal articles. With these features, participants could keep in contact with instructors long-term.

Finally, another future direction for PACE could be incorporating a mentor program in which previous PACE participants who have experienced success in their rehabilitation and PA involvement can pair with current PACE participants. Mentors would act as tutors and facilitators throughout the rehabilitation journey as well as serve as an in-class resource for participants. However, before adaptations to the current PACE program can be made, several limitations that were present during the study must be addressed.
Limitations

The study experienced a number of limitations related to common operating issues within the outpatient rehabilitation program. First, over a time period of 6.5 months (Jan-Aug) only twenty-two participants were eligible for participation within the PACE study. Additionally, over the subsequent 6.5 month time period (Aug-Feb), only 10 participants were eligible for the standard of care group. This small and unequal sample size limited the ability to utilize more sophisticated data analysis techniques (e.g., multivariate analysis of covariance). In addition, the PACE participants did not begin and complete the PACE program at the same time. Some participants entered the program at Session 1, while others entered Session 9, etc. This potentially created an issue in delivering course content. For example, if a participant started the PACE program at Session 5, they received an abbreviated version of previous topics along with a full review of Session 5 material. Those that began PACE at Session 1 received full session content for Sessions 1-5. Even though PACE curriculum was designed to prepare for this event, it is not the ideal teaching environment. Variable enrollment length was another clinical issue, meaning that participants could remain in the outpatient rehabilitation program for eight weeks or longer, or as little as two weeks. Several factors influenced each participant’s length of stay, including insurance coverage, speed of recovery and severity of impairments. PACE participants attended an average of 11 out of 16 sessions (5.5 weeks; min = 5 sessions or 2.5 weeks; max = 15 sessions or 7.5 weeks). The number of sessions attended was also influenced by time absent for reasons such as illness or doctor appointments. A fourth limitation was the incorrect scoring of the amount and intensity of PA measure. During both the pretests and posttests, participants did not fully complete the questionnaire, indicating only which type of PA that best described their lifestyle (e.g., “At work I do moderate activities for at least 10 minutes at a time”, etc.)
instead of indicating how many 10-minute bouts of moderate or vigorous activity they completed per week. Even though this measure had been used previously without user or administrator error (Driver et al., 2012; Ravesloot et al., 2005; USDHHS, 2001), the researchers for the current study should have reviewed all measures prior to use and should have trained the outpatient staff on how present the measure to patients. In response to this error, the amount and intensity of PA measure was not included in the study. In future research involving the PACE program, the instructions for this questionnaire should be made more explicit, and all measures should be piloted. A fifth limitation was the retrieval and scoring of the 3-month follow-up data for the MPAI-4 form. For the pretest and posttest, therapists from the outpatient program evaluated and scored patients. However, for the three month follow up, PACE participants evaluated themselves which may have resulted in different scores being recorded than what may have been reported by therapists. As a result, the 3-month follow-up MPAI-4 scores were not used in the data analysis for PACE. Additionally, PACE researchers did not solicit instructions from the outpatient facility on how to calculate the total MPAI-4 scores.
CONCLUSION

Costly, challenging, and dynamic describe life following brain injury. Furthermore, as individuals with brain injury navigate through the environmental, physical, and psychosocial barriers of recovery, they become more likely to experience secondary and chronic conditions. Although past research associates regular physical activity (PA) with positive rehabilitation outcomes (i.e., the decrease in limitation of acquired, chronic, and secondary conditions), most rehabilitation programs do not include PA education interventions. Results indicated that a PACE program can fit into the patients’ standard of care as rehabilitation outcomes were comparable and perceptions of ability were increased after completion. With additional research and evidence to support the efficacy of PACE, it can be shown that PA education is a vital component absent from most brain injury rehabilitation programs.

Table 6
PACE Participant Demographics

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49
Table 6 (continued).

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*Note.* MI = days of weekly moderate intensity exercise.

Table 7

**Standard of Care Group Characteristics**

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Table 7 (continued).

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Note. MI = days of weekly moderate intensity exercise
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<th>Participant</th>
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<th>PA Pre</th>
<th>PA Post</th>
<th>Pain+</th>
<th>Health~</th>
<th>N Sessions</th>
<th>Sessions Attended (in order)</th>
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<tbody>
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<td>0</td>
<td>5</td>
<td>Fair</td>
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<td>15, 16, 1, 2, 3, 4, 5, 6, 7, 8</td>
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<td>3/31/2011</td>
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<td>0</td>
<td>4</td>
<td>Fair</td>
<td>11</td>
<td>12, 14, 15, 16, 1, 6, 7, 8, 9, 10, 11</td>
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<td>1/17/2011</td>
<td>stroke</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>Fair</td>
<td>5</td>
<td>14, 15, 16, 1, 2</td>
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<td>6/3/2011</td>
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<td>4</td>
<td>1</td>
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<td>12/1/2010</td>
<td>stroke</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>Fair</td>
<td>14</td>
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<td>2/16/2011</td>
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<td>2</td>
<td>0</td>
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<td>Poor</td>
<td>13</td>
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<td>2/16/2011</td>
<td>stroke post surgery</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Poor</td>
<td>14</td>
<td>4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 1</td>
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<tr>
<td>Female 4</td>
<td>1/3/2011</td>
<td>stroke</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>Poor</td>
<td>11</td>
<td>1, 2, 3, 4, 5, 6, 9, 11, 12, 14, 15</td>
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<tr>
<td>Male 5</td>
<td>6/10/2011</td>
<td>car accident</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>Excellent</td>
<td>9</td>
<td>3, 4, 5, 6, 7, 8, 10, 11, 12</td>
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<tr>
<td>Female 5</td>
<td>6/27/2011</td>
<td>stroke</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>Fair</td>
<td>6</td>
<td>8, 9, 10, 1, 2, 5</td>
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<td>Male 6</td>
<td>12/17/2010</td>
<td>stroke</td>
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<td>5</td>
<td>0</td>
<td>Good</td>
<td>11</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11</td>
</tr>
<tr>
<td>Female 6</td>
<td>5/16/2011</td>
<td>hit by car while walking</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>Very good</td>
<td>8</td>
<td>6, 7, 8, 9, 10, 11, 1, 2</td>
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<td>Male 7</td>
<td>1/4/2011</td>
<td>stroke</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>Fair</td>
<td>7</td>
<td>1, 2, 3, 4, 5, 6, 7</td>
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<tr>
<td>Male 8</td>
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<td>0</td>
<td>Good</td>
<td>9</td>
<td>1, 2, 3, 4, 5, 7, 8, 11, 12</td>
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<td>stroke</td>
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<td>0</td>
<td>8</td>
<td>Fair</td>
<td>16</td>
<td>13, 14, 15, 16, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12</td>
</tr>
<tr>
<td>Male 9</td>
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<td>stroke</td>
<td>2</td>
<td>0</td>
<td>8</td>
<td>Fair</td>
<td>9</td>
<td>3, 4, 5, 6, 7, 8, 10, 11, 12</td>
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(table continues)
Table 8 (continued).

<table>
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<tr>
<th>Participant</th>
<th>Date of Injury</th>
<th>Etiology</th>
<th>PA Pre*</th>
<th>PA Post^</th>
<th>Pain+</th>
<th>Health~</th>
<th>N</th>
<th>Sessions attended (in order)</th>
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<tbody>
<tr>
<td>Male 10</td>
<td>5/21/2011</td>
<td>car accident</td>
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<td>0</td>
<td>Very good</td>
<td>7</td>
<td>12, 1, 2, 3, 4, 5, 6</td>
</tr>
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<td>Female 8</td>
<td>12/8/2010</td>
<td>stroke</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>Fair</td>
<td>5</td>
<td>9, 10, 11, 12, 13</td>
</tr>
<tr>
<td>Male 11</td>
<td>12/19/2010</td>
<td>stroke</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>Fair</td>
<td>15</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</td>
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<td>Male 12</td>
<td>4/23/2011</td>
<td>stroke</td>
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<td>0</td>
<td>0</td>
<td>Very good</td>
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<tr>
<td>Male 13</td>
<td>4/12/2011</td>
<td>motorcycle accident</td>
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<td>0</td>
<td>3</td>
<td>Excellent</td>
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<td>14, 15, 16, 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12</td>
</tr>
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<td>Male 14</td>
<td>3/6/2011</td>
<td>stroke</td>
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<td>0</td>
<td>Good</td>
<td>15</td>
<td>12, 13, 14, 15, 16, 1, 2, 3, 4, 5, 7, 8, 9, 10, 11</td>
</tr>
</tbody>
</table>

*Number of days per week participant engaged in moderate-intensity PA preinjury; ^ Number of days per week participant engaged in moderate-intensity PA postinjury; + Number of days in past month that pain has interfered with everyday activities; ~ Self-description of general health (Excellent; very good; good; fair; poor)

Table 9

Standard of Care Demographic Characteristics

<table>
<thead>
<tr>
<th>Participant</th>
<th>DOB</th>
<th>Date of Injury</th>
<th>Etiology</th>
<th>PA Pre*</th>
<th>PA Post^</th>
<th>Pain+</th>
<th>Health~</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male 1</td>
<td>11/23/1984</td>
<td>9/13/2011</td>
<td>car accident</td>
<td>7</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Male 2</td>
<td>10/8/1986</td>
<td>7/11/2011</td>
<td>gun shot</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>Poor</td>
</tr>
<tr>
<td>Male 3</td>
<td>8/23/1980</td>
<td>10/14/2011</td>
<td>drug reaction</td>
<td>4</td>
<td>0</td>
<td>5</td>
<td>Fair</td>
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<tr>
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<td>9/23/1959</td>
<td>9/18/2011</td>
<td>stroke</td>
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<td>0</td>
<td>unknown</td>
<td>unknown</td>
</tr>
<tr>
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<td>8/19/1946</td>
<td>8/27/2011</td>
<td>stroke</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>Good</td>
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<tr>
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<td>5/14/1992</td>
<td>10/12/2011</td>
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<td>0</td>
<td>unknown</td>
<td>unknown</td>
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<td>9/17/1971</td>
<td>11/21/2011</td>
<td>stroke</td>
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<td>unknown</td>
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<tr>
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<td>3/1/1961</td>
<td>9/13/2011</td>
<td>stroke</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>Fair</td>
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</table>

* Number of days per week participant engaged in moderate-intensity PA preinjury; ^ Number of days per week participant engaged in moderate-intensity PA postinjury; + Number of days in past month that pain has interfered with everyday activities; ~ Self-description of general health (Excellent; very good; good; fair; poor)
Table 10

**MPAI-4 Results PACE**

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<tr>
<th>Subscale</th>
<th>PACE $M$ pre</th>
<th>$SD$ pre</th>
<th>PACE $M$ post</th>
<th>$SD$ post</th>
<th>Difference</th>
<th>$ES$</th>
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<tr>
<td>Abilities</td>
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<td>6.45</td>
<td>38.55</td>
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<td>14.28</td>
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<td>1.57</td>
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<tr>
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<td>4.64</td>
<td>38.40</td>
<td>8.88</td>
<td>-10.50</td>
<td>2.26</td>
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<td>Total</td>
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<td>5.82</td>
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<td>13.18</td>
<td>-14.35</td>
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<td>41.93</td>
<td>33.47</td>
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<td>37.51</td>
<td>30.98</td>
<td>-6.53</td>
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<tr>
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<td>38.40</td>
<td>40.84</td>
<td>30.89</td>
<td>-9.95</td>
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Table 11

**MPAI-4 Results Standard of Care**

<table>
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<tr>
<th>Subscale</th>
<th>pre $M$</th>
<th>$SD$</th>
<th>post $M$</th>
<th>difference</th>
<th>$ES$</th>
<th>2008 pre $M$</th>
<th>2008 post $M$</th>
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<tr>
<td>Abilities</td>
<td>48.11</td>
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<td>39.50</td>
<td>8.61</td>
<td>1.73</td>
<td>41.93</td>
<td>33.47</td>
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<tr>
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<td>7.17</td>
<td>31.50</td>
<td>7.61</td>
<td>1.06</td>
<td>37.51</td>
<td>30.98</td>
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<tr>
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<td>38.56</td>
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<td>34.13</td>
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Table 12

*Self-Efficacy Results PACE*

<table>
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<tr>
<th>Subscale</th>
<th>Pre $M$</th>
<th>Post $M$</th>
<th>% Change Pre-Post SD Pre 3 Mos Post 3 Mos</th>
<th>% Change from Pre 3 Month SD Post</th>
<th>ES Pre-Post ES Post 3 Mo ES Pre-3 Mo</th>
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<tbody>
<tr>
<td>Negative effect</td>
<td>3.43</td>
<td>3.62</td>
<td>5.36 1.50 3.90 7.76 13.54 1.12 0.12 0.25 0.31</td>
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<td></td>
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<tr>
<td>Excuse making</td>
<td>2.57</td>
<td>4.00</td>
<td>55.93 1.50 3.30 -17.50 28.64 1.15 0.96 -0.61 0.49</td>
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</tr>
<tr>
<td>Exercising alone</td>
<td>3.87</td>
<td>4.00</td>
<td>3.37 1.53 3.60 -10.00 -6.97 1.34 0.09 -0.30 -0.18</td>
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</tr>
<tr>
<td>Inconvienient</td>
<td>3.57</td>
<td>4.00</td>
<td>12.20 1.52 4.00 0.00 12.20 1.00 0.29 0.00 0.29</td>
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<td></td>
</tr>
<tr>
<td>Resistance from others</td>
<td>3.09</td>
<td>3.48</td>
<td>12.61 1.56 3.50 0.68 13.38 1.17 0.25 0.02 0.27</td>
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<tr>
<td>Weather</td>
<td>3.00</td>
<td>3.80</td>
<td>26.67 1.57 2.73 -28.23 -9.09 1.15 0.51 -0.93 -0.17</td>
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</tr>
<tr>
<td>Total</td>
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<td>3.82</td>
<td>19.36 1.53 3.50 -7.88 8.62 1.16 0.37 -0.26 0.17</td>
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Table 13

*Self-Efficacy Standard of Care*

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre M</th>
<th>Post M</th>
<th>Pre SD</th>
<th>ES</th>
<th>% change</th>
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<td>3.50</td>
<td>3.50</td>
<td>1.58</td>
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<td>Excuse making</td>
<td>2.90</td>
<td>3.10</td>
<td>1.37</td>
<td>0.15</td>
<td>6.90</td>
</tr>
<tr>
<td>Exercising alone</td>
<td>3.90</td>
<td>3.80</td>
<td>1.37</td>
<td>0.07</td>
<td>-2.56</td>
</tr>
<tr>
<td>Inconvenient</td>
<td>3.11</td>
<td>3.40</td>
<td>1.36</td>
<td>0.21</td>
<td>9.29</td>
</tr>
<tr>
<td>Resistance from others</td>
<td>3.20</td>
<td>2.40</td>
<td>1.48</td>
<td>0.54</td>
<td>-25.00</td>
</tr>
<tr>
<td>Weather</td>
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<td>2.60</td>
<td>0.63</td>
<td>0.95</td>
<td>-18.75</td>
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<td>Total mean</td>
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<td>0.20</td>
<td>-5.02</td>
</tr>
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</table>

Table 14

*Stage of Change Results PACE*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Precontemplation</th>
<th>Contemplation</th>
<th>Preparation</th>
<th>Action</th>
<th>Maintenance</th>
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<tr>
<td>Female 1</td>
<td>Pretest</td>
<td>X</td>
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Table 14 (continued).

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<td>X</td>
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<td>3 mo fu</td>
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Table 15

*Exercise Stage of Change Standard of Care*

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Table 16

*Z test for Significance*

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<td>33</td>
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58
APPENDIX A

PACE MATERIALS
SESSION 1 – INTRODUCTION

Why is this program important?

- Many people don’t fully understand what physical activity is and its role in rehabilitation and a healthy life.
- Physical activity is the leading indicator of health.
  - What does “health” mean to you?
  - What is an “indicator of health”?
  - What are some things that people who are healthy usually have in common? (e.g. Eat a healthy diet, visit the doctor regularly, regular physical activity, supportive family, etc.)
  - What components of health (i.e. physical, mental, emotional, and social) are most important to you?
- People who have experienced brain injuries are at a greater risk of developing many health complications. Physical activity can help prevent many of these conditions.
  - Have you experienced any health complications because of your brain injury?

What will we talk about?

- WEEK 1 – Introduction to physical activity
- WEEK 2 – How exercise is medicine for you
- WEEK 3 – How you can set goals and overcome barriers
- WEEK 4 – How you can change your behavior
- WEEK 5 – How to deal with things that get in your way
- WEEK 6 – Physical activity and your quality of life
- WEEK 7 – Reviewing your goals
- WEEK 8 – How to maintain the new you

What is physical activity?

- Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
  - Can you think of anything you do that fits this definition?

How does physical activity affect my health?

- Part of your rehabilitation
  - Restore ability for activities of daily living
  - Increase independence
  - Increase quality of life
  - Reduce risk of secondary conditions
- Increases heart health
  - A strong heart can pump lots of blood in each pump, reducing the need for the heart to strain and work hard at rest
- This gives you more energy, because your heart can keep up with everything you want to do
- Increases lung and blood vessel health
  - Lower blood pressure
  - Increases lungs’ ability to pass oxygen to your blood – gives you more energy
- Increases muscle strength and endurance
  - Everyday tasks are easier if you’re stronger
- Increases balance and flexibility
  - Reduces the risk of falling as you get older – which helps maintain independent living for longer
- Helps maintain a healthy body weight
  - Reduces risk of many secondary conditions that can be caused by being overweight or obese (e.g. heart disease, high blood pressure, joint pain, diabetes, etc.)
- Helps increase energy and ability to complete daily activities
  - Can complete daily activities with less help from family and caregivers

How often should I exercise?

- The U.S. Department of Health and Human Services has National Guidelines for Adults
  - How did they come up with these guidelines?
    - 150 minutes per week of moderate intensity activity OR
    - 75 minutes per week of vigorous intensity activity
    - 2 or more days per week of muscle strengthening exercises
    - **Aerobic activity should be in at least 10-minute increments
    - ** Splitting activity up to at least 3 days per week is most beneficial
    - **Flexibility and stretching are important parts of physical fitness
  - Do you currently get this much physical activity?
  - How often and for how long are you typically active in one week?
  - What activities do you participate in?

How hard should I exercise? What is Light, Moderate, and Vigorous Exercise?

- Intensity – turn to “Physical Activity Effort Scale” in back of workbook
- How do I know what my “target heart rate” is? Has a physician directed me to stay below a defined rate?
  - Explain MAX heart rate
  - Discuss 220-age
  - American Heart Association recommends 50-85% of MAXHR
<table>
<thead>
<tr>
<th>Age</th>
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<tr>
<td></td>
<td></td>
<td>100 %</td>
</tr>
<tr>
<td>20 years</td>
<td>100–170 beats per minute</td>
<td>200 beats per minute</td>
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<tr>
<td>25 years</td>
<td>98–166 beats per minute</td>
<td>195 beats per minute</td>
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<tr>
<td>70 years</td>
<td>75–128 beats per minute</td>
<td>150 beats per minute</td>
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- What is a **MET**?
  - **Metabolic Equivalent**:
    - 1 MET = rest
    - 2 METs = working twice as hard as you do at rest
- Discuss compendium for exercise and show in appendix

**What types of activities count as exercise?**

Read each example and decide if the activity meets the guidelines for healthy physical activity

Playing basketball on the driveway – Breathing hard and sweating – Total time is 20 minutes

YES  NO

Walking down the driveway to check the mail

YES  NO

Vacuuming the house – Breathing a little harder than rest – Total time is 7 minutes

YES  NO

Vacuuming the house and carrying the laundry upstairs – Breathing hard – Total time is 15 minutes

YES  NO

Taking a leisurely walk with a family member – Not breathing harder than rest – Total time is 20 minutes

YES  NO

Working in the garden – Breathing a little harder than rest – Total time is 1 hour

YES  NO
Grocery shopping, pushing a cart, and loading groceries into the car – Breathing a little harder than rest – Total time is 40 minutes
   YES      NO

A round of golf
   YES      NO

Taking kids to the park
   YES      NO

CASE STUDY

Melissa’s doctor told her she needed to start getting more physical activity in order to stay healthy. However, Melissa hates running and there is no gym close to her house. She enjoys taking her dog for walks, but usually only gets around to it once a week, and then only makes time for a short walk around the block. Melissa decides to turn her weekly dog walk into a good source of physical activity. She begins gradually increasing the length of time she walks and how fast she walks. Now Melissa takes her dog on a walk five days a week and typically walks at a quick enough pace to make her breathe hard for at least half an hour. Melissa feels more energetic and is able to accomplish everyday tasks because she’s stronger.

What activities do you enjoy? How can you modify them to turn them into a good source of physical activity?

“I don’t exercise to add years to my life, I exercise to add life to my years.”

Session 1
INTRODUCTION TO PHYSICAL ACTIVITY
Why is this program important for me?

BACKGROUND:

- Many people don’t fully understand what physical activity is and its role in rehabilitation and a healthy life.
- Physical activity is the leading indicator of health.
  - Physical, mental, emotional, and social health
- People who have experienced TBIs are at a greater risk of developing many health complications. Physical activity can help prevent many of these conditions.

PROGRAM GOAL FOR ME:

- This program will help me learn about physical activity and change my behavior to increase the amount of physical activity in my life.

What will we talk about?

- WEEK 1 – Introduction to physical activity
- WEEK 2 – How exercise is medicine for you
- WEEK 3 – How you can set goals and overcome barriers
- WEEK 4 – How you can change your behavior
- WEEK 5 – How to deal with things that get in your way
- WEEK 6 – Physical activity and your quality of life
- WEEK 7 – Reviewing your goals
- WEEK 8 – How to maintain the new you

What is physical activity?

- Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

How does physical activity affect my health?

- Key part of your rehabilitation
- Increases heart health
• Increases lung and blood vessel health
• Increases muscle strength and endurance
• Increases balance and flexibility
• Helps maintain a healthy body weight
• Helps increase energy and ability to complete daily activities

How often should I exercise?

• The U.S. Department of Health and Human Services has National Guidelines for Adults
• How did they come up with these guidelines?

Physical Activity Guidelines for Americans

150 minutes per week of moderate intensity activity

OR

75 minutes per week of vigorous intensity activity

AND

2 or more days per week of muscle strengthening exercises

** Each bout of aerobic activity should last at least 10 minutes **
** Splitting activity up into at least 3 days per week is most beneficial **
** Flexibility and stretching are important parts of physical fitness **

How hard should I exercise?

What is Light, Moderate, and Vigorous Activity?

• Intensity – turn to “Physical Activity Effort Scale” in back of workbook
• How do I know what my “target heart rate” is?
• What is a MET?
What activities count as exercise?

Read each example and decide if the activity meets the guidelines for healthy physical activity

- Playing basketball on the driveway – Breathing hard and sweating – Total time is 20 minutes
  - Yes
  - No

- Vacuuming the house – Breathing a little harder than rest – Total time is 7 minutes
  - Yes
  - No

- Vacuuming the house and carrying the laundry upstairs – Breathing hard – Total time is 15 minutes
  - Yes
  - No

- Taking a leisurely walk with a family member – Not breathing harder than rest – Total time is 20 minutes
  - Yes
  - No

- Working in the garden – Breathing a little harder than rest – Total time is 1 hour
  - Yes
  - No

- Grocery shopping, pushing a cart, and loading groceries into the car – Breathing a little harder than rest – Total time is 40 minutes
  - Yes
  - No

- Walking down the driveway to check the mail
  - Yes
  - No

- A round of golf
  - Yes
  - No

- Taking kids to the park
  - Yes
  - No
**Case Study**

Melissa's doctor told her she needed to start getting more physical activity in order to stay healthy. However, Melissa hates running and there is no gym close to her house. She enjoys taking her dog for walks, but usually only gets around to it once a week, and then only makes time for a short walk around the block. Melissa decides to turn her weekly dog walk into a good source of physical activity. She begins gradually increasing the length of time she walks and how fast she walks. Now Melissa takes her dog on a walk five days a week and typically walks at a quick enough pace to make her breathe hard for at least half an hour. Melissa feels more energetic and is able to accomplish everyday tasks because she’s stronger.

**What activities do you enjoy?**

**How can you modify them to turn them into a good source of physical activity?**

---

**Quote of the Day:**

“I don’t exercise to add years to my life, I exercise to add life to my years.”

---

**SESSION 2- Introduction into Physical Activity Part II**
Review from last session

• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

• “Exercise can be as good as medicine”
  o How does exercise affect MY health and rehabilitation?

• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?

What’s so wrong with being inactive?

• The role of inactivity in American Life
  o 60% of American adults are reported to lead sedentary lives
    What does this mean?
    • Not enough activity to gain health benefits
    • Where do you receive the majority of your physical activity?
      • At work, at school, or away from work and school? (It will come up that currently most people in the group receive their activity at rehab)
    • Where do you receive the least amount of physical activity?
    • Where (?When?) do you have the most time to be active?
    • What groups of people are the least active?
      • (our seniors, women, African-Americans and Hispanic Americans)

• The Consequence of Inactivity to General Public
  ▪ Premature death
  ▪ Cardiovascular Disease
  ▪ High blood pressure
  ▪ Youth obesity rates have doubled (why does this matter?)
  ▪ Obesity stemming from inactivity is projected to overtake smoking as the leading cause of preventable death
  ▪ Inactive adults have a greater risk of developing diabetes and colon cancer
    o What do you think the consequences might be for YOU if you live an inactive lifestyle after you finish rehab?
      • (harder time returning to normal – maybe never get there, secondary conditions)

• Did you know? The silver lining
  ▪ Results of Harvard University alumni study found men in the bottom 5th in terms of heart fitness at the beginning of the study and later improved
their fitness to at least a moderate physical activity regime had a 44% lower death rate than those who remained inactive.

- **What does this mean for us?**
  - You don’t have to be active right now to still receive benefits from PA. You get benefits no matter when you start.
  - Those that expended 1,000 calories per week in PA (brisk walking for 30 minutes a day, 5 days a week) had a 24% reduction in their risk of stroke.
  - Expending 2,000 calories per week reduced their risk of stroke by 46%
  - If this is the Science, why are 60% of Americans still inactive???
  - Most don’t realize a small adjustment to their physical activity habits have substantial impacts to health down the road

**Is it safe for me to exercise?**

- **Exercising safely**
  - *Is exercise safe? Why/Why not?*
  - Risks for exercise
    - Death in rare cases, but benefits of exercise outweigh the minimal risk of death
    - Soreness in the bones, muscles, tendons, and joints- especially if one is new to exercise
      - This discomfort is usually expected and isn’t a sign of injury
    - Minor injury to bones, muscles, tendons, and joints- especially if intensity and time of exercising is increased rapidly versus gradually.
  - Risks of NOT exercising
    - *What are the long-term risks of not exercising??*  
      - Consequences listed above...
    - *In your opinion, is it worth it to exercise?*

**How can I reduce the risk of injury while exercising?**

- **What are ways to minimize injury?**
  - Movements that are not advised specific to TBI (and CVA)
    - Physical Therapist input – Think SAFE list
    - Get to know your heart rate- what is normal what isn’t
    - Do you feel dizzy
    - Get to know your sweat patterns- abnormal amounts of sweat (for you) may indicate distress
    - Get to know your breathing patterns during exercise
    - Warm up for at least 10 minutes to loosen joints and to slowly increase breathing
    - Gradually add a few extra minutes of exercise every week until you are able to meet the requirements for healthy physical activity
    - Once you reach your time goal (150 minutes a week) gradually increase your intensity
    - DRINK WATER- throughout your physical activity
• What changes with your body should you expect when you begin PA?
  ▪ Breathe heavier, but should not feel out of breath
  ▪ Skin will flush slightly as blood moves to the skin’s surface to cool you down
  ▪ If new to exercise, you may feel a slight burn in the working muscles, but body will adjust, and overtime, this burn will lessen substantially
  ▪ You will sweat!!!! This is a good thing!

Exercise Myths Activity

Several exercise myths are listed below. What makes each myth false? How can you reword the myth to make it a true statement?

  o I can easily hurt myself participating in PA, so it’s not worth it.
  o I have to work out really hard to see any benefits, and I am not able to do that.
  o People only need to exercise if they have a weight problem.
  o Exercise isn’t fun, it’s hard work.
  o I’m too old to learn how to exercise
  o If I can’t be active for the amount of time recommended (150 minutes per week), than it’s not worth it to do any exercise. I won’t receive any benefits, and it’s too much work to fit into my schedule.

CONTINUING PHRASES
  • “Exercise can be as good as medicine”
  • “Sweat a little every day”
  • “It’s never too late to start exercising”
  • “Inactivity is risky business”
What’s so wrong with being inactive?

Inactivity in American Life:
- 60% of Americans are reported to lead sedentary lives
- The consequences of inactivity can be severe:
  - High blood pressure
  - Cardiovascular disease
  - Obesity
  - Diabetes
  - Cancer
- Obesity is expected to soon become the leading cause in preventable death (the current leading cause is smoking)

The good news:
- If you’re not active right now, it’s not too late to get benefits from exercise
- You can benefit from exercise no matter when you start

Is it safe for me to exercise?

- Risks for exercise:
  - Benefits of exercise far outweigh the risks
  - Sometimes muscle and joint soreness occurs
How can I reduce the risk of injury while exercising?

- Always ask your physical therapist and doctor if there are any exercises you shouldn’t do
- Get to know what feels normal and what doesn’t
  - Heart rate
  - Breathing
  - Amount of sweat
- Warm up slowly for at least 10 minutes before exercising hard
- Increase time and intensity a little at a time
- Drink LOTS of water!

What changes can I expect when I begin exercising?

- Heavy breathing
- Skin may flush
- Slight burn in working muscles
- Sweat is a good thing!

**Exercise Myths Activity**

Several exercise myths are listed below. What makes each myth false? How can you reword each sentence to make it a true statement?

I could really hurt myself exercising, so it’s not worth it.

I have to work out really hard to see benefits, and I am not able to do that.

Session 3 - Exercise is medicine- General Population
Review

• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

• “Exercise can be as good as medicine”
  o How does exercise affect MY rehabilitation?

• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?

• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor

• Is it ever too late to start exercising?

Exercise is Medicine

• The Greeks had it right 2000 years ago
  o Hippocrates – said the safest way to health was eating healthy and exercising

• Does anyone take any medications? Anyone take more than one? Anyone enjoy taking them?

• If there was one magic medication that didn’t have to be swallowed, injected, inserted, sorted, cut, measured, renewed, refrigerated, mixed, approved or cost money and would better all your chronic conditions, would you take it?

• Would that magic medication be worth it if you had to use it most days for the rest of your life?

CASE STUDY:

“Kelley used to be VERY inactive. Because of this, she had a lot of health problems. Every morning, she took a pill for her cholesterol, a pill for her blood pressure, a pill for joint pain, and she had to check her blood sugar and possibly take insulin. Throughout the day, she took medicine for back pain, medicine for headaches, and caffeine pills for more energy. Every night Kelley took a sleeping pill because she experienced insomnia. All of this medicine was very expensive and had some unpleasant side effects. Then someone told Kelley that she could use exercise as medicine to help reduce the amount of pills she took daily. Now Kelley takes only a minimum amount of medicine as recommended by her doctor, and has replaced most of her pills with physical activity. Kelley feels better than ever.”

DISCUSSION:

• Sometimes medicine is necessary, and we shouldn’t expect to get off all medications in a short period of time
• Always check with a doctor before stopping any medication
• PA is a great way to reduce the amount of medication your body relies on over time
Exercise is medicine, cont’d

- Exercise is that medicine
  - 90 million Americans living with life long health conditions (ex. diabetes, cardiovascular disease)
    - These conditions are expensive
    - These conditions contribute to lower quality of life
      - What do you consider a good quality of life?
      - What are aspects of your life that make your day more enjoyable?
        - (i.e. ability to cook, time with family, independence, community involvement)
  - These conditions contribute to depression and other mood disorders
  - These conditions contribute to a shortened life span

Most of these conditions are preventable if exercise is used like medicine

<table>
<thead>
<tr>
<th>Condition</th>
<th>Effect/Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVD</td>
<td>Decreases risk of CVD and may stop and even reverse CVD symptoms</td>
</tr>
<tr>
<td>CVD with Rehab Program</td>
<td>Patients have fewer complications, hospital visits, and have 20-25% lower death rates</td>
</tr>
<tr>
<td>Hypertension</td>
<td>More exercise equals lower blood pressure</td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>Reduces chance of developing more severe symptoms. Both aerobic and resistance exercises associated with decreased risk of diabetes</td>
</tr>
<tr>
<td>CHD (plaque in blood vessels)</td>
<td>Exercise may reduce issues of plaque in blood vessels</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Endurance PA increases good cholesterol (HDL) and decreases bad cholesterol (LDL)</td>
</tr>
<tr>
<td>Cancer Prevention</td>
<td>Increased immune function associated with regular PA</td>
</tr>
<tr>
<td>Mental Health</td>
<td>Exercise-induced changes in chemicals that affect depression</td>
</tr>
<tr>
<td>Falls and Related Death</td>
<td>Muscular fitness associated with significantly lower risk of premature death mainly from the reduction in falls and the sickness that follows</td>
</tr>
</tbody>
</table>

Exercise doesn’t have to be a pain – activity can be fun!

Exercise is not just about how you look, but about how you feel and your health.

Exercise helps you live the life you want to live.

REVIEW VIDEO
CONTINUING PHRASES
• “Exercise can be as good as medicine”
• “Sweat a little every day”
• “It’s never too late to start exercising”
• “Inactivity is risky business”

Session 3
EXERCISE IS MEDICINE FOR EVERYONE

Exercise is Medicine

• Hippocrates said the safest way to health was eating healthy and exercising
• 90 million Americans live with long-term health conditions
  o Sometimes medication is necessary, BUT
  o Exercise is a great way to reduce the amount of medication your body relies on over time
• Many conditions are preventable if exercise is used like medicine

What can exercise do for long-term conditions?

<p>| Cardiovascular Disease (CVD) | Decreases risk of CVD and may stop and even reverse CVD symptoms |</p>
<table>
<thead>
<tr>
<th>CVD with Rehab Program</th>
<th>Patients have fewer complications, hospital visits, and have 20-25% lower death rates</th>
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<tr>
<td>Coronary Heart Disease</td>
<td>Exercise may reduce issues of plaque in blood vessels</td>
</tr>
<tr>
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<td>Endurance PA increases good cholesterol (HDL) and decreases bad cholesterol (LDL)</td>
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</tbody>
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**Session 4- Exercise is Medicine for TBI and Stroke**

**Review**

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - How does exercise affect MY health and rehabilitation?
- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?
- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor
- Is it ever too late to start exercising?

**What conditions might I have to deal with because of my brain injury?**

- Common issues immediately after brain injury
  - What issues have you experienced as a result of your injury?
  - Paralysis- issues with motor control
  - Problems with balance, walking, and posture
  - Sensory Issues- Partial or full loss of touch, pain, temperature, or body position
  - Issues with the ability to speak, write, or understand spoken/written language
  - Issues with memory and thinking- shortened attention spans
  - Emotional concerns- fear, anxiety, anger, and frustration
  - Cognitive issues- organizing thoughts, time management
• Preventable health issues that may result from stroke or TBI:
  • High blood pressure
  • High Cholesterol
  • Diabetes Mellitus- abnormal sugar in the blood
  • Heart Disease
  • Poor Diet
  • Alcoholism
  • Physical Inactivity

How will my brain injury affect my ability to exercise?
  • My body is less able to use the oxygen I breathe in
  • My heart can't work quite as hard as it could before my injury
  • My breathing will become harder during exercise
  • I will get tired quicker
  • I may become less able to complete activities of daily living
    o Have you noticed any of these effects during your rehab?
    o Do you think these effects impact your ability to start exercising now?
    o Do you think it's possible to still receive benefits from exercise?

How will inactivity affect my life after brain injury?
  • Higher risk for the conditions mentioned earlier that further delay recovery
  • Significant functional consequences
    o What is a functional consequence?
    o What are examples of functional activities that YOU value?
  • Decreased ability to return to work
  • Decreased ability to do your job well
    o Why is that?
  • Decreased ability to function inside and outside the house independently
  • Decreased quality of life

Effects of Physical Activity on TBI/Stroke

<table>
<thead>
<tr>
<th>Having another stroke</th>
<th>Physical Activity can reduce risk of death due to another stroke by 20% or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>Physical Activity can reduce risk of death due to heart disease by 20% or more</td>
</tr>
<tr>
<td>Ability to use oxygen during exercise</td>
<td>Increased by 60% with leg cycling exercises (not a medicine for that)</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Improved (lowered)</td>
</tr>
<tr>
<td>Resting heart rate</td>
<td>Improved (lowered)</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>Improved (lowered)</td>
</tr>
<tr>
<td>Type of Fitness</td>
<td>Physical Activity Suggestions</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Aerobic</td>
<td>Cycling, Walking, Seated Stepper, Upper and Lower Body Ergometer</td>
</tr>
<tr>
<td>Strength</td>
<td>Free Weights, Stationary Exercise, Free Weights, Bands</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Stretching</td>
</tr>
<tr>
<td>Coordination and Balance</td>
<td>Assisted balance exercises (examples from PT)</td>
</tr>
</tbody>
</table>

**Bingo:**

CONTINUING PHRASES

- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”

Appendix list so far:

1. US Department Exercise Guidelines
2. Surgeon General’s Report
3. Adapted Work Rate Scale
4. Adapted Met Scale
5. Compendium of Exercise
6. Glossary of terms
7. Goal Sheets
8. PA journal
Session 4
EXERCISE IS MEDICINE FOR BRAIN INJURY

What conditions might I have to deal with because of my brain injury?

- Common conditions immediately after brain injury:
  - Paralysis
  - Problems with balance, walking, and posture
  - Sensory issues
  - Issues with the ability to speak, write, or understand spoken/written language
  - Issues with memory and thinking
  - Emotional concerns
  - Cognitive issues

- Preventable health issues that may result from TBI or stroke:
  - High blood pressure
  - High Cholesterol
  - Diabetes
  - Heart Disease
  - Poor Diet
  - Alcoholism
  - Physical Inactivity
How will my brain injury affect my ability to exercise?

All the conditions below are affected by your genetics and your individual neurological response to your brain injury

- My body is less able to use the oxygen I breathe in
- My heart can’t work quite as hard as it could before my injury
- My breathing will become harder during exercise
- I will get tired quicker
- I may become less able to complete activities of daily living

How will inactivity affect my life after brain injury?

- Higher risk for conditions that further delay recovery
- Significant functional consequences
- Decreased ability to return to work
- Decreased ability to do your job well
- Decreased ability to function inside and outside the house independently
- Decreased quality of life
SESSION 5 – GOAL-SETTING

Review

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - How does exercise affect MY health and rehabilitation?
- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?
- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor
- Is it ever too late to start exercising?

How do I decide what goals are right for me?

- What is a goal?
  - What you want the end result of a behavior to be
    - What do you want the end result of your education to be?
    - What do you want the end result of your efforts at work to be?
    - What do you want the end result of parenting your children to be?
    - What do you want the end result of your rehab to be?
  - Why do you set goals?
    - How do goals help you start and continue a new behavior?
      - Give me something specific to achieve (a plan)
    - What goals do you currently have for yourself?
      - In rehab, at home, at work?
    - How do you try to achieve these goals?
      - Lists, schedules, share it with loved ones
    - What goals have you set in the past that have been successful?
      - Why were they successful?
    - What goals have you set in the past that were unsuccessful?
      - Why?
- Review goals instructors have set for class
  - You would understand why PA is important for your health and rehab
  - You would think it’s important to start exercising
  - You would begin fit regular exercise into your schedule
• You plan how to overcome things that get in your way of exercising so you can be active long-term
  o What is the difference between a short-term goal and a long-term goal?

**How do I set good goals?**

• Goals you set for yourself should be SMART:
  o **S – Specific**
    ▪ Goals should be clear-cut and describe exactly what you want to achieve
    ▪ WHAT are you going to do?
    ▪ HOW are you going to do it?
    ▪ WHY is this goal important to you?
    ▪ Good Example: “I want to get more exercise. I am going to swim and pool walk at the community pool. My caregiver will drive me to the pool on Tuesdays and Thursdays when she has free afternoons. This is important to me because I want to take care of my health and have more energy.”
    ▪ Bad Example: “I want to swim more.”
  o **M – Measurable**
    ▪ “You can’t manage it if you can’t measure it.”
    ▪ Decide a way to measure if you’re staying on track with your goals.
    ▪ Good Example: “I want to swim for 30 minutes each time I go to the pool. I want to stay at the “Somewhat Hard” level of the Physical Activity Work Scale for the whole 30 minutes.”
    ▪ Bad Example: “I want to swim until I get tired.”
  o **A – Adjustable**
    ▪ You should have a plan to adjust (change) your goal in the face of barriers so you can still succeed
    ▪ Brainstorm barriers (or things that get in your way) that might keep you from achieving your goal, and think of ways you can adjust the goal to keep reaching for success
    ▪ Good Example: “If I get sick and miss a week of swimming, I may work at a “Fairly Light” level if “Somewhat Hard” feels too challenging after taking a week off.”
    ▪ Bad Example: “If I get sick, I’ll wait until I feel better to start swimming again.”
  o **R – Realistic**
    ▪ Realistic doesn’t mean effortless, it just means possible
    ▪ A goal needs to be realistic for your abilities at this moment, not at some time in the future
    ▪ Make sure to set a challenging enough goal that you feel accomplished when you achieve it
    ▪ Good Example: “Right now I know that I won’t be able to swim for an hour. Maybe in the future I can make that my goal, but for now I’d like
to swim for 30 minutes, knowing that it’s enough of a challenge that I’ll still have to take a few rests during that time.”

- Bad Example: “I’ve never spent much time swimming before, but I plan to compete in a triathlon next month.”

  o T – Timely
  - Goals need to have a set time in which you’d like to achieve them
  - If you don’t set a time frame for your goal, you may not feel that starting soon is important
  - Good Example: “I am going to start my swimming next Monday, even if I don’t feel strong enough to swim for 30 minutes that day. By the beginning of next month, I will be fully committing to swimming two days per week for 30 minutes.”
  - Bad Example: “I’ll start my swimming sometime this month.”

- Talk through “Goal Setting Worksheet” as a class
- Help individuals write specific goal statements and plan when they will work to achieve the goal

Continuing Phrases:
- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting”

Session 5
GOAL SETTING

How do I decide what goals are appropriate for me?
What is a goal?
- What you want the end result of a behavior to be
- Examples:
  - What do you want the end result of **your education** to be?
  - What do you want the end result of **your efforts at work** to be?
  - What do you want the end result of **parenting your children** to be?
  - What do you want the end result of **your rehab** to be?

Why do you set goals?
- To give yourself a target to aim for
- What goals have you set in the past?
- What makes goals successful or unsuccessful?

How do I set good goals?

Goals you set for yourself should be SMART

S – Specific
- Goals should be clear-cut and describe exactly what you want to achieve
- WHAT are you going to do?
- HOW are you going to do it?
- WHY is this goal important to you?

M – Measurable
- “You can’t manage it if you can’t measure it.”
- Decide a way to measure if you’re staying on track with your goals.

A – Adjustable
• You should have a plan to adjust (change) your goal in the face of barriers so you can still succeed
• Brainstorm barriers (or things that get in your way) that might keep you from achieving your goal, and think of ways you can adjust the goal to keep reaching for success

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T – Timely
• Goals need to have a set time in which you’d like to achieve them
• If you don’t set a time frame for your goal, you may not feel that starting soon is important

SESSION 6 – BARRIERS: IDENTIFICATION, ACKNOWLEDGEMENT, AND STRATEGY

Review
• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
• “Exercise can be as good as medicine”
  o What are the effects of exercise on overall health?
  o How does exercise affect MY health and rehabilitation?
• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?
• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor
• Is it ever too late to start exercising?
• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?

What barriers do you face?
  o What is a barrier?
Things that get in the way of achieving your goals

What are your goals?

What’s important in your life right now?

Is there a way that physical activity can help you to obtain that goal?

- Family - quality time spent in healthy behavior
- Returning to work - explain PA role in stamina to make it through a workday, etc.
- Independence - PA role in improving functioning and completing ADLs
- Stay healthy - PA role in preventing/limiting secondary conditions and recurrent hospital visits
- Just want to make it through the day - PA effect on depression/mood elevation
- Weight control - PA can help that too!

Let’s say PA is your goal - What are your personal barriers to becoming active?

Split into groups and reevaluate goals from set last week.

- Progress on the goals
- Adjustments
- Each participant brainstorms 3 possible barriers

Return to large group:

- Walk through barriers worksheet with group
- Each participant shares barriers with group

As a group, brainstorm solutions to each barrier using the strategies provided

BARRIERS WORKSHEET:

- Identification - Group brainstorming activity of common barriers to being physically active
  - (if we need to intervene) - transportation
  - Don’t have someone to help me with exercises
  - I don’t believe exercise will help me
  - I believe exercise might make my condition worse
  - It costs too much money
  - Just don’t want to
  - Not enough time
  - Weather
  - Don’t know where to begin
  - Too tired
- Don’t have support at home
- I’m too old
- I may get hurt/have another stroke
- I don’t see the value in making time

  - **Acknowledgement** - Individual exercise on identifying individual barriers - each participant to fill in on their own individual worksheet

  - **Actual Barriers** - Physical or environmental conditions that keep you from being active
    - Examples:
      - “I normally walk outside, but can’t if the weather is bad”
      - “I don’t have someone to drive me to a place where I can be active”

  - **Perceived Barriers** – Your opinion of the cost of exercise
    - Examples:
      - “I believe exercise might make my condition worse”
      - “I’m too tired and too old to begin exercising”

  - What is a true obstacle for your life and what is a perceived obstacle - both real, but true obstacles require extra problem solving strategies
  - Separate your list into actual v perceived barriers

  - **Strategy**
    - Group activity brainstorming group’s strategies to overcome obstacles
    - Individual time to put overcoming barriers into individual context (individual help from facilitator)
    - Goal setting worksheet: Make sure goals set last session are *adjustable* based on the barriers brainstormed – Instructors will pick one example and lead class through goal setting strategy for overcoming and obstacle
    - Homework - report back results of action and any other barriers faced

Continuing Phrases:
- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
Session 6
BARRIERS:
Identification, Acknowledgement, and Strategy

What barriers do you face?

What is a barrier?
  • Things that get in the way of achieving your goals

What are your goals?
  • What’s important in your life right now?

Barriers Worksheet

What are common barriers to being physically active?

What barriers might you face when trying to be active?
What’s the difference between *actual* and *perceived* barriers?

- **Actual Barriers** - Physical or environmental conditions that keep you from being active
  - Examples:
    - “I normally walk outside, but can’t if the weather is bad”
    - “I don’t have someone to drive me to a place where I can be active”

- **Perceived Barriers** – Your opinion of the cost of exercise
  - Examples:
    - “I believe exercise might make my condition worse”
    - “I’m too tired and too old to begin exercising”

Take your list of barriers from the previous page and divide them into actual and perceived barriers:

<table>
<thead>
<tr>
<th>Actual</th>
<th>Perceived</th>
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How will you overcome the barriers listed above? Brainstorm solutions as a group.

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Solution</th>
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</tbody>
</table>
SESSION 7 – BEHAVIOR CHANGE & TRACKING BEHAVIOR

Review

• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

• “Exercise can be as good as medicine”
  o What are the effects of exercise on overall health?
  o How does exercise affect MY health and rehabilitation?

• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?

• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor

• Is it ever too late to start exercising?

• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?
  o How have you planned for barriers?

• Barriers
  o Difference between actual and perceived

What “Stage of Behavior Change” am I in?

• What stage of behavior change am I in? (circle which stage fits you best)
  o Precontemplation – I have no serious intention to change my physical activity behavior in the near future
    ▪ How to move forward:
      • Do I understand the benefits of physical activity?
      • What are the consequences of being inactive?
      • Am I unsure about participating in physical activity for any reason?
      • Do I believe I have the ability to be active?
o **Contemplation** – I’ve been thinking about becoming more physically active. I want to do this in the next 6 months, but I haven’t started yet.
  - **How to move forward:**
    - What barriers keep me from participating in physical activity? E.g., Lack of knowledge, time, money, access, etc.
    - What motivates me to overcome my barriers?
    - What types of activities would I be interested in?
    - Do I have SMART goals to help me get started slowly?

o **Preparation** – I am interested in participating in physical activity and I am ready to begin now, **OR**, I currently exercise but not on a regular basis.
  - **How to move forward:**
    - Do I have a plan for regular physical activity?
    - Do I know how to monitor my progress? E.g., using an exercise journal, etc.
    - Do I have a support network of people who encourage me?
    - Do I reward myself when I achieve my goals?

o **Action** - I have become active on a regular basis (*according to US physical activity guidelines*) in the past six months. I am still learning how to overcome barriers to being active.
  - **How to move forward:**
    - Do I have goals for my long-term participation in physical activity?
    - Do I have a buddy that encourages me?
    - Have I had setbacks in my progress? How will I plan to overcome those next time?
    - What motivates me to continue to participate?

o **Maintenance** – I have been successfully active (*according to US physical activity guidelines*) for 6 months or more.
  - **How to stay here:**
    - Do I continue to set realistic goals for myself?
    - Do I have a group of people who support me?

### CASE STUDY #1

Karen has never really liked exercising. She doesn’t like to get sweaty and she doesn’t think that exercise is important for her. She likes hanging out with her friends, and spends most of her free time in social activities. She feels that she shouldn’t have to worry about her health while she’s young, she can worry about it when she gets older.

- What stage of change is Karen in?
  - **Precontemplation**
- How could you help Karen move to the next stage of change?
  - **Knowledge of benefits of PA**
  - **Risks of inactivity**
CASE STUDY #2

Martin has had poor health in the past, and recently experienced a heart attack. During cardiac rehabilitation, Martin learned about the benefits of exercise and how important it is in keeping his heart healthy. Martin was very active during rehab, as his therapists were there to show him what to do. Now that Martin has been discharged and is living at home, he wants to be active, but is unsure that he has the ability to continue on his own.

- What stage of change is Martin in?
  - Preparation
- How could you help Martin move to the next stage of change?
  - Teach him to plan his PA to eventually meet the guidelines of 150 minutes/week
  - Teach him to monitor his activity with a behavior journal
  - Encourage him to join a support group that will help him stay motivated and ask his family to become active with him

CASE STUDY #3

Kim has become active in the past 6 months and consistently exercises for 150 minutes per week or more. She usually drives 20 minutes to the gym every morning to take a spin class and lift weights. Recently, Kim and her husband had to cut back to only one vehicle, which her husband drives to work, and Kim no longer had transportation. She is left to decide if she will stop exercising or find another way to stay active.

- What stage of change is Kim in?
  - Action
- How you help Kim move to the next stage of change?
  - Create a plan to overcome barriers
  - Set long-term goals for PA
  - Enlist a family member or friend as an encourager and workout buddy
  - Help her find motivation to continue

Take individual time for each participant to complete the Behavior Change Worksheet

- What do I need to do in order to move from my current stage into the next one?
  - See “How to Move Forward” under each stage of change
- What barriers prevent me from changing these behaviors?
• Are the goals I’ve set for myself helping me to move from the stage I’m in to the next stage?
  • See “Behavior Change Worksheet”

Split into groups and discuss:
  o Goals and barriers
  o Stage of behavior change
  o How participants can set goals to help them move to the next stage

Continuing Phrases:
  • “Exercise can be as good as medicine”
  • “Sweat a little every day”
  • “It’s never too late to start exercising”
  • “Inactivity is risky business”
  • “Be SMART about goal-setting, and plan for barriers”

Session 7
Behavior Change and Tracking Behavior

What “Stage of Behavior Change” am I in?

  o Precontemplation – I have no serious intention to change my physical activity behavior in the near future
    • How to move forward:
      • Do I understand the benefits of physical activity?
      • What are the consequences of being inactive?
      • Am I unsure about participating in physical activity for any reason?
      • Do I believe I have the ability to be active?
Contemplation – I’ve been thinking about becoming more physically active. I want to do this in the next 6 months, but I haven’t started yet.

- How to move forward:
  - What barriers keep me from participating in physical activity? E.g., Lack of knowledge, time, money, access, etc.
  - What motivates me to overcome my barriers?
  - What types of activities would I be interested in?
  - Do I have SMART goals to help me get started slowly?

Preparation – I am interested in participating in physical activity and I am ready to begin now, OR, I currently exercise but not on a regular basis.

- How to move forward:
  - Do I have a plan for regular physical activity?
  - Do I know how to monitor my progress? E.g., using an exercise journal, etc.
  - Do I have a support network of people who encourage me?
  - Do I reward myself when I achieve my goals?

Action - I have become active on a regular basis (according to US physical activity guidelines) in the past six months. I am still learning how to overcome barriers to being active.

- How to move forward:
  - Do I have goals for my long-term participation in physical activity?
  - Do I have a buddy that encourages me?
  - Have I had setbacks in my progress? How will I plan to overcome those next time?
  - What motivates me to continue to participate?

Maintenance – I have been successfully active (according to US physical activity guidelines) for 6 months or more.

- How to stay here:
  - Do I continue to set realistic goals for myself?
  - Do I have a group of people who support me?

CASE STUDY #1

Maria has never really liked exercising. She doesn’t like to get sweaty and she doesn’t think that exercise is important for her. She likes hanging out with her friends, and spends most of her free time in social activities. She feels that she shouldn’t have to worry about her health while she’s young, she can worry about it when she gets older.

What stage of change is Maria in?
How could you help Maria move to the next stage of change?

### CASE STUDY #2

Martin has had poor health in the past, and recently experienced a heart attack. During cardiac rehabilitation, Martin learned about the benefits of exercise and how important it is in keeping his heart healthy. Martin was very active during rehab, as his therapists were there to show him what to do. Now that Martin has been discharged and is living at home, he wants to be active, but is unsure that he has the ability to continue on his own.

What stage of change is Martin in?
How could you help Martin move to the next stage of change?

### CASE STUDY #3

Kim has become active in the past 6 months and consistently exercises for 150 minutes per week or more. She usually drives 20 minutes to the gym every morning to take a spin class and lift weights. Recently, Kim and her husband had to cut back to only one vehicle, which her husband drives to work, and Kim no longer had transportation. She is left to decide if she will stop exercising or find another way to stay active.

What stage of change is Kim in?
How you help Kim move to the next stage of change?

### SESSION 8 – BEHAVIOR CHANGE: THE ROLE OF REWARDS AND MOTIVATION
Review

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - How does exercise affect MY health and rehabilitation?

- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?

- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor

- Is it ever too late to start exercising?

- “Be SMART about Goal Setting”
  - What does SMART stand for? Examples?
  - What is your goal currently?
  - How have you planned for barriers?

- Barriers
  - Difference between actual and perceived

What motivates me to be active?

- Why do I believe it’s important to be active?
  - For my health and rehabilitation
  - To be with family and friends
  - To be able to return to and stay at work
  - To control my weight and look good
  - Competition?

- What are my top 3 motivations to be active?
  - LIST HERE

- How can I increase my motivation to be active?
  - Discussion on motivations – are you:
    - Self-motivated
    - Group Motivated (i.e. competitive with others)
    - Not easily motivated

What is a reward?
What is a reward?
- How does it increase motivation?
- Does it hold monetary value?
- Cool new kicks or workout clothes
- Something simple, like coffee with a friend or a new book?
- Something more extravagant?
- Is it sentimental?
  - Self-satisfaction
- Are there other types of rewards?

How can rewards help me reach my goals?
- Are you motivated by rewards? If not, what motivates you?
  - Does your reward move you closer to your goal?
    - Ex. Buying new workout clothes or shoes
  - Does your reward move you further away from your goal?
    - Ex. A cheeseburger after exercising

- Ask for volunteer to identify one of their obstacles and the goal they set to achieve it (just needed to write strategy to overcome obstacle, but did not need to execute strategy yet)
  - Group brainstorming session on how to reward overcoming obstacle
    - Will the rewards discussed motivate this person to achieve their goal?
    - Will the rewards discussed move this person closer or further away from their goal?

Individual time - write a list of rewards that motivate you and that will move you closer to achieving your goals.

Small groups – discuss goals, barriers, and rewards. Adjust goals as needed.

Homework for next week – achieve goal and earn reward, and get to grab from the PACE Swag Bag

Continuing Phrases:
- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
Session 8
Behavior Change
The Role of Rewards and Motivation

Rewards

- **What is a reward?**
  - Does it hold monetary value?
  - Cool new kicks or workout clothes
  - Something simple, like coffee with a friend or a new book?
  - Something more extravagant?
  - Is it sentimental?
  - Self-satisfaction
  - Are there other types of rewards?

- **How can rewards help me reach my goals?**
  - Are you motivated by rewards? If not, what motivates you?
  - Does your reward move you closer to your goal?
  - Ex. Buying new workout clothes or shoes
  - Does your reward move you further away from your goal?
  - Ex. A cheeseburger after exercising

Discussion on motivations – are you: circle one
- Self-motivated
- Group Motivated (i.e. competitive with others)
- Not easily motivated

**Homework for next week** – achieve your goal and come next session to receive a prize!
SESSION 9 – THE SOCIAL SIDE OF PHYSICAL ACTIVITY

Review

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - What are the effects of exercise on aging?
  - How does exercise affect MY health and rehabilitation?

- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?

- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor

- Is it ever too late to start exercising?

- “Be SMART about Goal Setting”
  - What does SMART stand for? Examples?
  - What is your goal currently?
  - How have you planned for barriers?

Barriers

- Difference between actual and perceived
  - REVIEW COMMON BARRIERS
- What’s the best way to deal with frustration?
  - Turn it into motivation

How can being social help me stay active?

- What is social support?
- Finding a group of friends or family members who value physical activity can be very helpful in overcoming barriers that you may come across

- What barriers do you face when trying to be active?
  - Feelings of isolation and apathy
  - Lack of support from friends, family, and co-workers
  - PA is “too hard”
  - Not motivated to adopt PA lifestyle
  - Tire too easily to adopt PA lifestyle
- Lack of transportation
- Safety issue of engaging in PA alone
- Review barriers mentioned in previous classes

**Why is having a support network helpful?**
- Spending time with others who value the same things helps you feel less isolated
- Having friends who are physically active helps encourage you to achieve your physical activity goals
- Watching others work to stay active helps make it easier to stay active yourself
- Exercise is more fun when you can do it with friends and family

**Research has consistently shown that belief in ability and social support are the strongest predictors of PA adoption and maintenance. You need other people to be successful.**

**What's your biggest barrier to staying active?**
**How can finding social support help you overcome that barrier?**

**How can being social increase my motivation?**
**Why do I believe it's important to be active?**
- For my health and rehabilitation
- To be with family and friends
- To be able to return to and stay at work
- To control my weight and look good
- Competition?

**What are my top 3 motivations to be active?**
- LIST HERE

**Ideas for how to be active with those you care about:**
- Start a family tradition of walking/bike riding/hiking together
- Spend your “coffee date” with a friend doing something active together instead of sitting
- Find family friendly events (e.g., Fun Runs, Festivals, park play, family sports)
- Enlist the help of family and friends to raise money for your favorite charity by doing a walk/run event in your community

**How do I make physical activity social?**

**How can YOU create a support group of people who encourage your physical activity?**

**Ideas for creating an activity support circle:**
- Keep connection with your friends from rehab and regularly encourage one another to reach activity goals
- Ask a buddy to be your “motivation partner” – help each other set goals, exercise together, and encourage one another when you feel discouraged
  - Who will keep you accountable if you don’t complete your workout?
- Google your favorite activity and find a group in your area that you can join and meet new people
- Search internet for local walking/jogging events and clubs in your community
  - Initiate a walk group before work or at lunch among your coworkers
  - Train with a friend for a walk or 5k race that requires a few months of training and preparation
  - Join group exercise class at community/fitness center
  - Volunteer to be a walking buddy at senior care facility – commit to volunteer for a specific number of hours per week
  - Volunteer to walk dogs at local shelter

**CASE STUDY:**

Marty’s “exercise buddies” keep him going

*(National Institute on Aging- Your Everyday Guide)*

“Every morning I head out to the mall — not to shop, but to join my mall-walkers group. At 75, I’m one of the youngest members. When I retired, my wife Harriet insisted that we walk every morning. Some of us move at a steady clip through the mall, while others take a slower pace. We count our laps and keep a daily record of our progress — pushing ourselves to go a little faster, a little farther.

When Harriet died unexpectedly, it was quite a blow, but the walkers were my lifeline. They kept me moving when all I wanted to do was sit. At first, I walked because it was something to do each morning. But now, I realize that I like how it feels to be moving. Measuring how fast I can walk gives me goals, something to work toward. I walk and feel stronger every day. I often think of Harriet and silently thank her for insisting that we walk together.”

10 minute small group time to review and adjust goals AND create a social support goal

**Continuing Phrases:**
- “Exercise can be as good as medicine”
- “Exercise helps me be independent”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
- “Turn frustration into motivation”
Session 9
The Social Side of Physical Activity

How can being social help me stay active?

- Finding a group of friends or family members who value physical activity can be very helpful in overcoming barriers that you may come across.

- Why is having a support network helpful?
  - Spending time with others who value the same things helps you feel less isolated.
  - Having friends who are physically active helps encourage you to achieve your physical activity goals.
  - Watching others work to stay active helps make it easier to stay active yourself.
  - Exercise is more fun when you can do it with friends and family.
  - Active friends can help you with transportation, new exercise ideas, and safety while exercising.

How can being social increase my motivation?
What are my top 3 motivations to be active?

__________________________________________________________________________________________
Ideas for how to be active with those you care about:

✓ Start a family tradition of walking/bike riding/hiking together
✓ Spend your “coffee date” with a friend doing something active together instead of sitting
✓ Find family friendly events (e.g., Fun Runs, Festivals, park play, family sports)
✓ Enlist the help of family and friends to raise money for your favorite charity by doing a walk/run event in your community

How do I make physical activity social?

Ideas for creating an activity support circle:

✓ Keep connection with your friends from rehab and regularly encourage one another to reach activity goals
✓ Ask a buddy to be your “motivation partner” – help each other set goals, exercise together, and encourage one another when you feel discouraged
✓ Google your favorite activity and find a group in your area that you can join and meet new people
✓ Initiate a walk group before work or at lunch among your coworkers
✓ Train with a friend for a walk or 5k race that requires a few months of training and preparation
✓ Join group exercise class at community/fitness center
✓ Volunteer to be a walking buddy at senior care facility – commit to volunteer for a specific number of hours per week
✓ Volunteer to walk dogs at local shelter
Marty’s “exercise buddies” keep him going

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Homework for next session – Think of a social support goal
SESSION 10 – MANAGING FRUSTRATION & DISCOURAGEMENT

Review
- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - How does exercise affect MY health and rehabilitation?
- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?
- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor
- Is it ever too late to start exercising?
- “Be SMART about Goal Setting”
  - What does SMART stand for? Examples?
  - What is your goal currently?
  - How have you planned for barriers?
- Barriers
  - Difference between actual and perceived

CASE STUDY
Julia had a stroke several months ago, and has been through inpatient and outpatient rehab. She learned why it was important to live an active lifestyle, how to adapt her habits to include exercise, and how to set goals in order to be active. However, Julia is aware of a future barrier. Julia’s husband travels for work, and is planning to be out of town for the next month. Julia normally gets a ride from her husband to the exercise class offered at her local gym. She cannot drive herself, but she knows it is important to continue going to the exercise class. She is feeling frustrated that she cannot independently drive herself, and is worried that she will not be able to reach her exercise goals while her husband is gone. What should she do?

How do barriers make me feel?
- What barriers did you list that may keep you from being active?
- Have you run into any of them yet?
  - What about barriers to past goals?
  - Barriers to rehab goals?
- How did you feel about the barriers?
  - Discouragement, frustration
- No one can eliminate all feelings of frustration
- How you deal with frustration is the key
Don’t let it develop into depression and loss of motivation

What’s the best way to deal with frustration?

- Instead of letting your frustration grow, turn it into motivation to creatively overcome barriers
- Do you believe in your ability to overcome barriers to being active?
- Self-efficacy is your belief that you can achieve your goals even if barriers get in your way
- What is one area of your life in which you feel you have succeeded (met your goals)?
  - In this area do you BELIEVE you can meet your goals even if things get in your way?
  - What strengths do you possess that you feel helped you achieve this success?
- People tend to believe more in their own abilities when they have had success in the past
- Is there an area in your life in which you’ve experienced less success?
  - In this area do you BELIEVE you can meet your goals even if things get in your way?
- How do I increase my belief in myself even when I haven’t had success in the past?
  - Am I convinced that this goal is worth achieving?
    - Do I have second thoughts or fears about working hard to achieve my goal?
    - Would more knowledge about why the goal is important help to motivate me?
  - What benefits do I get from achieving my goal?
    - When you achieve your physical activity goals, how does that make you feel (physically) (emotionally)?
  - Have others set a good example?
    - Do you have a role model who has succeeded?
      - What are the qualities that helped this person succeed?
    - Do you have a family member or friend who is willing to help you succeed?
  - Have I connected with any friends from rehab?
    - How can you stay in contact with these therapists or friends so they can help you succeed?
  - Are my goals realistic?
  - Do I give myself rewards for getting closer to my goal?
    - What can you reward yourself with to make your effort worthwhile?
      - New workout equipment/clothes/shoes
      - Book/magazine/cd/dvd that you want
      - New songs for workout playlist
      - Coffee with a friend
      - Massage
      - Movie night with friends/family
How can I my family and friends help me deal with frustration?

- Do I have a network of people who support my physical activity goals?
  - Who are these people in your life?
  - Will these people be around for years to come?
  - How can you surround yourself with people who encourage you (“You are who you hang out with”)
- How can I encourage others around me to support my goals?
  - Would your support group be willing to join you in your physical activities?
  - If not, where can you meet friends who will?
  - How can you stay in touch with friends from rehab in order to encourage each other?
- How can I encourage others around me to achieve their goals?
  - Am I willing to spend time working on their goals?
  - Am I willing to be a role model? Do I believe I CAN be a role model?
  - What is most encouraging for me? How can I be this for others?
- Turn to a blank goal-setting worksheet, and take time to set a SMART goal describing how you and your support partner(s) will hold each other accountable to your physical activity goals.

What barriers is Julia facing? What should Julia do to overcome these barriers?

10 minute small group time to review and adjust goals

Continuing Phrases:

- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
- “Turn frustration into motivation”

Session 10
Managing Frustration and Discouragement
CASE STUDY

Julia had a stroke several months ago, and has been through inpatient and outpatient rehab. She learned why it was important to live an active lifestyle, how to adapt her habits to include exercise, and how to set goals in order to be active. However, Julia is aware of a future barrier. Julia’s husband travels for work, and is planning to be out of town for the next month. Julia normally gets a ride from her husband to the exercise class offered at her local gym. She cannot drive herself, but she knows it is important to continue going to the exercise class. She is feeling frustrated that she cannot independently drive herself, and is worried that she will not be able to reach her exercise goals while her husband is gone. What should she do?

What if I feel frustrated when I run into barriers?

What’s the best way to deal with frustration?

- Instead of letting your frustration grow, turn it into motivation to creatively overcome barriers
- Self-efficacy is your belief that you can achieve your goals even if barriers get in your way
- People tend to believe more in their own abilities when they have had success in the past

How do I increase my belief in myself even when I haven’t had success in the past?

- Do I have a network of people who support my physical activity goals?
• How can I encourage others around me to support my goals?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

How can I encourage others around me to achieve their goals?

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Thinking back to the Case Study –
What barriers did Julia face?
What should Julia do?

SESSION 11 – DEALING WITH DETOURS

Review
• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
• “Exercise can be as good as medicine”
  o What are the effects of exercise on overall health?
  o How does exercise affect MY health and rehabilitation?
• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?
• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor
• Is it ever too late to start exercising?
• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?
  o How have you planned for barriers?
• Barriers
  o Difference between actual and perceived
    ▪ REVIEW COMMON BARRIERS
  o What’s the best way to deal with frustration?

What is a detour?
• A detour is an unexpected change that interrupts your goal progress
  o What is the difference between a barrier and a detour?
    ▪ Barrier = an expected roadblock
      • Ex. Lack of transportation, money, etc.
    ▪ Detour = an unexpected roadblock
      • Ex. Sudden illness, accident, loss of employment, etc.
  o What are some possible detours that may keep you from being active?
    ▪ Unexpected illness (flu season)- yourself or family member
    ▪ Unexpected financial issues
    ▪ Change in routine/schedule (Holiday season-family visiting)

How do I deal with detours?
• Is dealing with a detour different from dealing with a barrier?
• Steps to dealing with detours:
  o What is your goal?
  o What is the detour keeping you from reaching your goal?
  o How do I adjust my goal to get back on track?
    ▪ Ex. Illness – start back slowly after illness passes
    ▪ Ex. Financial issues- may need to use walking paths or home videos if
gym membership is too expensive
    ▪ Ex. Family in town- put together a family walk after dinner

CASE STUDY 1
Gareth, a 17-year-old high school scholar and athlete was involved in a head on car
collision late in the summer, following football practice. After an extensive stay at BIR,
Gareth is ready to feel “normal” again and is anxious to toss the football around. Although
he has been active all his life, he tires easily and has issues catching his breath during
exercise. Gareth is aware that he must gradually work toward more vigorous physical
activity. Currently, he is walking with his mother most nights after dinner. His mother
assists when Gareth loses balance during the walks. After months of the indoor life, Gareth
looks forward to the outdoor time. Gareth’s mother, Ada, has recently been promoted to
director of a new facility and will be working late hours for the next six months. How
should Gareth overcome this detour?
10 minute small group time to review and adjust goals

Continuing Phrases:
- “Exercise can be as good as medicine”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
- “Turn frustration into motivation”

Session 11
Dealing with Detours

What is a detour?
A detour is an unexpected change that interrupts your goal progress

- What is the difference between a barrier and a detour?
- What are some possible detours that may keep you from being active?

How do I deal with detours?

Steps to dealing with detours:
- What is your goal?
- What is the detour keeping you from reaching your goal?
- How do I adjust my goal to get back on track?

CASE STUDY

Gareth, a 17-year-old high school scholar and athlete was involved in a head on car collision late in the summer, following football practice. After an extensive stay at BIR, Gareth is ready to feel “normal” again and is anxious to toss the football around. Although he has been active all his life, he tires easily and has issues catching his breath during exercise. Gareth is aware that he must gradually work toward more vigorous physical activity. Currently, he is walking with his mother most nights after dinner. His mother assists when Gareth loses balance during the walks. After months of the indoor life, Gareth looks forward to the outdoor time. Gareth’s mother, Ada, has recently been promoted to director of a new facility and will be working late hours for the next six months. How should Gareth overcome this detour?

SESSON 12 – PHYSICAL ACTIVITY AND QUALITY OF LIFE

Review

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - How does exercise affect MY health and rehabilitation?
- “Sweat a little every day”
  - How often and for how long should we exercise?
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• Is it ever too late to start exercising?
• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?
  o How have you planned for barriers?
• Barriers
  o Difference between actual and perceived
    ▪ REVIEW COMMON BARRIERS
  o What’s the best way to deal with frustration?
    ▪ Turn it into motivation

What is quality of life?
• Quality of life – general well-being
• What are important parts of your quality of life?
  o Low stress and depression
  o Spirituality
  o Time and energy for family and friends
  o Physical ability to participate in hobbies
  o Ability to take care of oneself
  o Mental health
• What activities of daily living contribute most to your independence?
  o Driving
  o Cooking
  o Personal hygiene
  o Cleaning
  o Hobbies
• Your ability to do activities of daily living declines about 1% every year after the age of 30.
  o As you age:
    ▪ You’ll feel tired easily
    ▪ You’ll have little energy to do the things you enjoy
    ▪ You may gain weight
    ▪ You may experience arthritis pain or general stiffness that keeps you from doing the things you love
    ▪ Your balance decreases, which results in a greater chance of falls
    ▪ You may break bones easily as a result of osteoporosis
    ▪ You lose strength, so you can’t take care of yourself, your house, and your family like you used to
• Thus, quality of life declines with age unless you do something to preserve your abilities
• While aging is a necessary part of life, isn’t it our goal to reduce the effects of aging so we can keep doing the things we want for as long as possible?
  o 1 in 6 people will now live to be 100 years old!
• Due to your brain injury, you may be at a higher risk of developing these age-related changes than others
How does being physically active increase my quality of life now?

- Being physically active can improve your quality of life because it has a major impact on your ability to:
  - Take care of yourself independently
  - Have the energy you need to spend time with loved ones
  - Maintain your ability to do things you love

How does being physically active increase my quality of life as I age?

- Physical activity helps to reduce the changes that happen with aging

- Consistent activity can:
  - Help heart maintain ability to pump efficiently
  - Keep blood pressure lower
  - Maintain strength and muscle mass
  - Increases bone mineral density – reducing risk of osteoporosis
  - Improve metabolism
  - Help control weight
  - Improve memory and reasoning
  - Reduce risk of heart disease, cancer, diabetes, and other serious illnesses

- Staying active helps you keep your ability to do activities of daily living

- Since your risk of decline in ability is higher than others because of your injury, you can benefit more from physical activity

ACTIVITY

Write 1 activity that you do now (or would like to do) independently to take care of yourself or your house:

How could regular exercise help you keep (or develop) the ability to do that activity?

Write 1 activity that you do now (or would like to do) independently as a hobby:

How could regular exercise help you keep (or develop) the ability to do that activity?
10 minute small group time to review and adjust goals – set a goal to increase an important aspect of quality of life

**Continuing Phrases:**
- “Exercise can be as good as medicine”
- “Exercise helps me be independent”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
- “Turn frustration into motivation”

**Session 12**

Physical Activity and Quality of Life

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**What is quality of life?**

Quality of life is general well being

- What are activities of daily living (ADLs) that contribute most to your independence?
- Your ability to do ADLs declines about 1% every year after age 30, unless you do something to preserve your abilities
  - Our goal is to reduce the effects of aging so we can do the things we want for as long as possible!
- Due to your brain injury, you may be at a higher risk of developing these age-related changes than others
How does being physically active increase my quality of life now?

Being physically active can improve your quality of life because it has a major impact on your ability to:

- Take care of yourself independently
- Have the energy you need to spend time with loved ones
- Maintain your ability to do things you love

How does being physically active increase my quality of life as I age?

- Physical activity helps to reduce the changes that happen with aging
- Consistent activity can:
  - Help your heart maintain the ability to pump efficiently
  - Help keep blood pressure lower
  - Maintain strength and muscle mass
  - Increases bone mineral density – reduces risk of osteoporosis
  - Improve metabolism
  - Help control weight
  - Improve memory and reasoning
  - Reduce risk of heart disease, cancer, diabetes, and other serious illnesses

- Staying active helps you keep your ability to do ADLs
- Since your risk of decline in ability is higher than others because of your injury, you can benefit more from physical activity

Activity

Write 1 activity that you do now (or would like to do) independently to take care of yourself or your house:

________________________________________________________________________
________________________________________________________________________

How could regular exercise help you keep (or develop) the ability to do that activity?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Write 1 activity that you do now (or would like to do) independently as a hobby:
______________________________________________________________________________
______________________________________________________________________________

How could regular exercise help you keep (or develop) the ability to do that activity?
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

SESSION 13 – GOAL EVALUATION

Review

• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.

• “Exercise can be as good as medicine”
  o What are the effects of exercise on overall health?
  o What are the effects of exercise on aging?
  o How does exercise affect MY health and rehabilitation?

• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?

• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor

• Is it ever too late to start exercising?

• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?
  o How have you planned for barriers?

• Barriers
  o Difference between actual and perceived
    ▪ REVIEW COMMON BARRIERS
  o What’s the best way to deal with frustration?
    ▪ Turn it into motivation

Have my goals been successful?
Session 13
Goal Evaluation

Have my goals been successful?

Think back to the goals you’ve set in the past few weeks. Have they been successful?

YES  NO  Partly
What do you need to change about the goal to make it successful?

*Think of SMART goals and write which part of the goal you need to adjust to make your goal achievable.*

_______________________________________________________________________________
_______________________________________________________________________________
_______________________________________________________________________________

After you have evaluated past goals, it’s time to make new ones. See attached goal worksheet and begin to set a new short-term goal and a new long term goal.

**SESSION 14 – Am I Headed in the Right Direction?**

**Review**

- **What is PA?**
  - *Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.*
- **“Exercise can be as good as medicine”**
  - *What are the effects of exercise on overall health?*
  - *What are the effects of exercise on aging?*
  - *How does exercise affect MY health and rehabilitation?*
- **“Sweat a little every day”**
  - *How often and for how long should we exercise?*
  - *What’s the minimum amount of time we should aim for?*
  - *What are some examples of activities that you might be able to fit into your schedule for exercise?*
- **What’s so wrong with being inactive? (Inactivity is risky business)**
  - *Consequences of PA vs. consequences of inactivity*
  - *Think SAFE list, Doctor*
- **Is it ever too late to start exercising?**
- **“Be SMART about Goal Setting”**
  - *What does SMART stand for? Examples?*
  - *What is your goal currently?*
  - *How have you planned for barriers?*
- **Barriers**
  - *Difference between actual and perceived*
    - REVIEW COMMON BARRIERS
o What’s the best way to deal with frustration?
  ▪ Turn it into motivation

What “Stage of Behavior Change” am I in now?
  • Do you feel you have progressed in your physical activity level since the beginning of the PACE program?
  • What stage of behavior change am I in? (circle which stage fits you best)
    o Precontemplation – I have no serious intention to change my physical activity behavior in the near future
    o Contemplation – I’ve been thinking about becoming more physically active. I want to do this in the next 6 months, but I haven’t started yet.
    o Preparation – I am interested in participating in physical activity and I am ready to begin now, OR, I currently exercise but not on a regular basis.
    o Action - I have become active on a regular basis (according to US physical activity guidelines) in the past six months. I am still learning how to overcome barriers to being active.
    o Maintenance – I have been successfully active (according to US physical activity guidelines) for 6 months or more.

  • Look back to Session 7 – what stage were you in?
  • Have you moved forward to a new stage in the past 3 ½ weeks?
  • If so, what strategies did you use to move forward (look back to the strategies on worksheet 7)?
    o Which strategies were the most helpful?
  • If not, did you use any of the strategies on worksheet 7?
    o Do you WANT to become more active? Why or why not?
    o What barriers kept you from moving forward?
  • Looking back to Session 7, what can you do now to move forward to the next stage?

How can I tell if I am benefiting from my activity?
  • Signs that your activity is helping you:
    o Mood has improved
    o Activity is easier
    o Daily life is more manageable
    o Increased energy
    o Less pain
    o Outlook on today, this week, life is better
    o Sleep is better
    o Symptoms of conditions are better (focus, collected thoughts, less frustration)
    o Say Yes more often (participate)
  • Are there any other benefits you’re noticing?
How can I keep track of my progress after the PACE program ends?

- Using a journal to track my activity and goals:
  - When, where, what, and how much activity you’re doing
  - Write barriers that you run into
  - Write how you overcome the barriers and how you plan to overcome them in the future
  - Write any feelings of success or frustration
  - Keep track of what motivates you to be active as these motivations change
  - Continuously decide if your rewards are still working
  - Update short-term and long-term goals and make plans for how you’ll achieve them

Small group sessions to discuss goals. Ask the following questions:

- Were the goals realistic? Challenging or too easy?
- Did you run into any barriers?
- Were you able to find ways to overcome barriers?
- Did you use rewards?
  - Do your rewards motivate you to work hard?
  - If not, what motivates you to be active? How can you choose a reward that increases this motivation?
- Did you hold yourself accountable or ask someone else to help hold you accountable for your goals?
- How do you need to modify your goal to make it more effective?
- New goals?

Homework assignment: Write one entry in your journal to share next session.

Continuing Phrases:

- “Exercise can be as good as medicine”
- “Exercise helps me be independent”
- “Sweat a little every day”
- “It’s never too late to start exercising”
- “Inactivity is risky business”
- “Be SMART about goal-setting, and plan for barriers”
- “Give yourself a pat on the back”
- “Turn frustration into motivation”

Session 14
Am I Headed in the Right Direction?

What “Stage of Behavior Change” am I in now?

Circle which stage fits you best:

- **Precontemplation**
  - I have no serious intention to change my physical activity behavior in the near future

- **Contemplation**
  - I’ve been thinking about becoming more physically active. I want to do this in the next 6 months, but I haven’t started yet.

- **Preparation**
  - I am interested in participating in physical activity and I am ready to begin now, **OR**, I currently exercise but not on a regular basis.

- **Action**
  - I have become active on a regular basis (*according to US physical activity guidelines*) in the past six months. I am still learning how to overcome barriers to being active.

- **Maintenance**
  - I have been successfully active (*according to US physical activity guidelines*) for 6 months or more.

Look back to Session 7 – what stage were you in?

_______________________________________________________________
Have you moved forward to a new stage in the past 3 ½ weeks?
______________________________________________

If so, what strategies did you use to move forward (look back to the strategies on worksheet 7)?

  o Which strategies were the most helpful?
    _______________________________________________________________________
    _______________________________________________________________________

If not, did you use any of the strategies on worksheet 7?

  o Do you WANT to become more active? Why or why not?
    _______________________________________________________________________
    _______________________________________________________________________
    _______________________________________________________________________
    _______________________________________________________________________

  o What barriers kept you from moving forward?
    _______________________________________________________________________
    _______________________________________________________________________
    _______________________________________________________________________
    _______________________________________________________________________

Looking back to Session 7, what can you do now to move forward to the next stage?
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

How can I tell if I’m benefiting from my activity?

  • Signs that your activity is helping you:
    o Mood has improved
    o Activity is easier
- Daily life is more manageable
- Increased energy
- Less pain
- Outlook on today, this week, life is better
- Sleep is better
- Symptoms of conditions are better (focus, collected thoughts, less frustration)
- Say Yes more often (participate)

---

**How can I keep track of my activity after the PACE Program ends?**

- Using a journal to track my activity and goals:
  - When, where, what, and how much activity you’re doing
  - Write barriers that you run into
  - Write how you overcome the barriers and how you plan to overcome them in the future
  - Write any feelings of success or frustration
  - Keep track of what motivates you to be active as these motivations change
  - Continuously decide if your rewards are still working
  - Update short-term and long-term goals and make plans for how you’ll achieve them

---

**Homework for next session** – Write one journal entry to share with your small group
SESSION 15 – MAINTENANCE – Keeping it Interesting

Review

- What is PA?
  - Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
- “Exercise can be as good as medicine”
  - What are the effects of exercise on overall health?
  - What are the effects of exercise on aging?
  - How does exercise affect MY health and rehabilitation?
- “Sweat a little every day”
  - How often and for how long should we exercise?
  - What’s the minimum amount of time we should aim for?
  - What are some examples of activities that you might be able to fit into your schedule for exercise?
- What’s so wrong with being inactive? (Inactivity is risky business)
  - Consequences of PA vs. consequences of inactivity
  - Think SAFE list, Doctor
- Is it ever too late to start exercising?
- “Be SMART about Goal Setting”
  - What does SMART stand for? Examples?
  - What is your goal currently?
  - How have you planned for barriers?
- Barriers
  - Difference between actual and perceived
REVIEWS COMMON BARRIERS

- What’s the best way to deal with frustration?
- Turn it into motivation

Review homework assignment from previous week – each person shares a journal entry

**How can I get new ideas to keep exercise interesting?**

- Sometimes exercise routines can start to feel repetitive. You may get bored and lose interest and motivation as a result.
- Search the internet for clubs, community centers, gyms, and exercise programs in your area.
- Use your location to your advantage:
  - If you live near trails and walking paths:
    - You can walk, jog, or ride bikes (with your physician’s consent) with a friend or family member
  - If you live near a gym or community center:
    - You can use treadmills, elliptical machines, and stationary bikes for aerobic exercise
    - You can use weight machines, free-weights, and resistance bands for total-body strengthening
    - See the examples on these websites (always ask your physician or therapist what exercises are safe for you):
      - [http://www.sportsinjuryclinic.net/strengthening/resistancebands.php](http://www.sportsinjuryclinic.net/strengthening/resistancebands.php)
      - [http://www.sportsinjuryclinic.net/strengthening/free_weights.php](http://www.sportsinjuryclinic.net/strengthening/free_weights.php)
  - You can try a variety of group exercise classes such as:
    - Step aerobics
    - Cycling
    - Pilates
    - Yoga
    - Kickboxing (Non-contact)
    - Weight-lifting and resistance training
  - You can ask a personal trainer for new exercise ideas
  - If you live near a swimming pool:
    - You can swim laps, walk in the pool, or take a water aerobics class
  - If you prefer to exercise in your home:
    - You can use exercise videos to guide your workouts
    - Use a gaming console, such as Wii Fit, to engage your family in fun activity
    - You can invest in some small exercise equipment like free-weights, resistance bands, a mat, and medicine balls
- Online resources:
  - [Battling Boredom in Your Workout](http://www.sportsinjuryclinic.net/strengthening/resistancebands.php)
- http://www.osteopathic.org/osteopathic-health/about-your-health/health-conditions-library/general-health/Pages/workout-boredom.aspx
  - Basic Guide to Interval Training:
  - How to Strength Train:
    - http://www.mayoclinic.com/print/strength-training/HQ01710/METHOD=print

Other online resources:
- How much physical activity do I need? How often? What counts?
- Why should I be active? What is standing in my way? How can I set goals and break through my barriers?
- Fitness Fundamentals:
  - http://www.fitness.gov/fitness.htm
- 10 Tips for Healthy Eating
  - http://www.fitness.gov/10tips.htm
- Eating and Exercise: 5 Tips to Maximize Your Workout
  - http://www.mayoclinic.com/print/exercise/HQ00594_D/METHOD=print
- Exercise and Cold Weather:
  - http://www.mayoclinic.com/health/fitness/HQ01681/METHOD=print
- Exercise and Hot Weather:
  - http://www.mayoclinic.com/print/exercise/HQ00316/METHOD=print
- When Money is a Barrier:
  - http://www.mayoclinic.com/print/fitness/HQ00694_D/METHOD=print
- Yoga for Brain Injury:

Guided small group journaling time – each person writes two new activities that they’d like to add to their exercise time in order to combat boredom, why they want to try these activities, and how they will find resources to participate

Continuing Phrases:
- “Exercise can be as good as medicine”
- “Exercise helps me be independent”
- “Sweat a little every day”
- “It’s never too late to start exercising”
“Inactivity is risky business”  
“Be SMART about goal-setting, and plan for barriers”  
“Give yourself a pat on the back”  
“Turn frustration into motivation”

Session 15
Maintenance – Keeping it Interesting

How can I get new ideas to keep exercise interesting?

• Sometimes exercise routines can start to feel repetitive. You may get bored and lose interest and motivation as a result.

• Search the internet for clubs, community centers, gyms, and exercise programs in your area

• Use your location to your advantage:
  
  o If you live near trails and walking paths:  
    ▪ You can walk, jog, or ride bikes (with your physician’s consent) with a friend or family member

  o If you live near a gym or community center:  
    ▪ You can use treadmills, elliptical machines, and stationary bikes for aerobic exercise  
    ▪ You can use weight machines, free-weights, and resistance bands for total-body strengthening
• See the examples on these websites (always ask your physician or therapist what exercises are safe for you):
  o http://www.sportsinjuryclinic.net/strengthening/resistancebands.php
  o http://www.sportsinjuryclinic.net/strengthening/free_weights.php

  ▪ You can try a variety of group exercise classes such as:
    • Step aerobics
    • Cycling
    • Pilates
    • Yoga
    • Kickboxing (Non-contact)
    • Weight-lifting and resistance training
  ▪ You can ask a personal trainer for new exercise ideas
  o If you live near a swimming pool:
    ▪ You can swim laps, walk in the pool, or take a water aerobics class

  o If you prefer to exercise in your home:
    ▪ You can use exercise videos to guide your workouts
    ▪ Use a gaming console, such as Wii Fit, to engage your family in fun activity
    ▪ You can invest in some small exercise equipment like free-weights, resistance bands, a mat, and medicine balls

  o Online Resources:
    ▪ Battling Boredom in Your Workout:
      • http://www.osteopathic.org/osteopathic-health/about-your-health/health-conditions-library/general-health/Pages/workout-boredom.aspx

    ▪ Basic Guide to Interval Training:
      • http://www.mayoclinic.com/health/interval-training/SM00110/METHOD=print

    ▪ How to Strength Train:
      • http://www.mayoclinic.com/print/strength-training/HQ01710/METHOD=print
      • http://www.mayoclinic.com/health/weight-training/SM00028/METHOD=print
Other online resources:

- How much physical activity do I need? How often? What counts?

- Why should I be active? What is standing in my way? How can I set goals and break through my barriers?

- Fitness Fundamentals:
  - http://www.fitness.gov/fitness.htm

- 10 Tips for Healthy Eating
  - http://www.fitness.gov/10tips.htm

- Eating and Exercise: 5 Tips to Maximize Your Workout
  - http://www.mayoclinic.com/print/exercise/HQ00594_D/METHOD=print

- Exercise and Cold Weather:
  - http://www.mayoclinic.com/health/fitness/HQ01681/METHOD=print

- Exercise and Hot Weather:
  - http://www.mayoclinic.com/print/exercise/HQ00316/METHOD=print

- When Money is a Barrier:
  - http://www.mayoclinic.com/print/fitness/HQ00694_D/METHOD=print

- Yoga for Brain Injury:
SESSION 16 – MAINTENANCE – Creating a Healthy Future

Review

• What is PA?
  o Physical movement for the purpose of getting healthier or maintaining a good level of health that results in using energy.
• “Exercise can be as good as medicine”
  o What are the effects of exercise on overall health?
  o What are the effects of exercise on aging?
  o How does exercise affect MY health and rehabilitation?
• “Sweat a little every day”
  o How often and for how long should we exercise?
  o What’s the minimum amount of time we should aim for?
  o What are some examples of activities that you might be able to fit into your schedule for exercise?
• What’s so wrong with being inactive? (Inactivity is risky business)
  o Consequences of PA vs. consequences of inactivity
  o Think SAFE list, Doctor
• Is it ever too late to start exercising?
• “Be SMART about Goal Setting”
  o What does SMART stand for? Examples?
  o What is your goal currently?
  o How have you planned for barriers?
• Barriers
  o Difference between actual and perceived
    ▪ REVIEW COMMON BARRIERS
  o What’s the best way to deal with frustration?
    ▪ Turn it into motivation

CASE STUDY

Glenda is entering her first week as a participant in the Day Nuero program at BIR. The PACE program is typically a part of the education program and has been a great success. At this time, BIR would like to pilot a new mentor program where past PACE participants help new Day Nuero patients with the physical activity education.

Because of your incredible success in the PACE program, you have been selected as a PACE mentor. You understand the ups and downs of the rehabilitation process and you now know the importance that physical activity can play in your rehabilitation and in the rehabilitation of your peers at BIR.

Glenda is recovering from a slip in the shower. In addition to the head injury she sustained during the fall, she also broke her wrist. Her cast has been removed. Her doctor has cleared her for moderate exercise, but not for driving. Before the accident, she volunteered as an
adult literacy tutor at the Vickery Meadow Learning Center in Dallas. She is retired and is not physically active.

Please assist Glenda with the following items:

1. Physical Activity 101
   a. Explain why physical activity is important for Glenda’s success in her rehabilitation journey
   b. Teach her how many minutes of physical activity per week will help her to achieve better health. Teach her the minimum amount of minutes in one session that counts as healthy physical activity.
   c. Teach her the risks of physical activity and risks of not being active.

2. Exercise is Medicine
   a. Explain what this means- give three examples of how exercise can be medicine
   b. Teach her three things that could be reduced if she becomes physically active

3. SMART Goals
   a. Teach Glenda what each letter in SMART stands for
   b. Help Glenda create a 2 week SMART activity goal that will help her start a physical activity habit

4. Barriers
   a. Inform/warn Glenda of some of the main barriers she will face to starting a physical activity program while participating in the Day Nuero program
   b. Teach Glenda a strategy for overcoming these barriers
   c. Inform/warn Glenda of possible detours that she might face

5. Social Support
   a. Inform Glenda of the importance of creating a circle of support around her as she begins to bring physical activity into her rehabilitation here and at home
   b. Give Glenda three examples of how she create a positive social circle of support around her.

Break large group into two groups and fill out review worksheet/ Mentor exercise

Time permitting- PACE Family Feud

Top 5 PACE continuing phrases

1. “Exercise can be as good as medicine”
2. “Sweat a little every day”
3. “It’s never too late to start exercising”
4. “Inactivity is risky business”
5. “Be SMART about goal-setting, and plan for barriers”
6. “Give yourself a pat on the back”
7. “Turn frustration into motivation”
Top 6 Barriers faced when becoming physically active (this will change for each group. We will continuously monitor the unique and universal barriers for each participant and group). 

*Below are examples*

1. Transportation
2. Finances
3. Not having time
4. Shortage of sidewalks or safe walking areas
5. Weather
6. Don’t know what to do at the gym

Top 5 adjectives that should describe your goals

1. Smart
2. Measurable
3. Adjustable
4. Realistic
5. Timely

Top 6 ideas to create a social support circle

1. Stay in contact with your BIR friends
2. Ask your family to join you in physical activity
3. Recruit a walking lunch group at work
4. Join a walking/running/hiking/rowing club
5. Participate in group exercise classes at community center/gym
6. Mall walk with a group

Top 5 Ways exercise can be medicine after taking genetics and longer term injury into consideration

1. Reduce the amount of medications needed
2. Reduce blood pressure
3. Reduce cholesterol
4. Reduce risk of heart disease
5. Reduce risk of subsequent stroke(s)
6. Increase Independence
7. Increase balance
8. Reduce stress and anxiety
9. Increase strength
Session 16
PACE Program Review

CASE STUDY

Glenda is entering her first week as a participant in the Day Nuero program at BIR. The PACE program is typically a part of the education program and has been a great success. At this time, BIR would like to pilot a new mentor program where past PACE participants help new Day Nuero patients with the physical activity centered education.

Because of your incredible success in the PACE program, you have been selected as a PACE mentor. You understand the ups and downs of the rehabilitation process and you now know the importance that physical activity can play in your rehabilitation and in the rehabilitation of your peers at BIR.

Glenda is recovering from a slip in the shower. In addition to the head injury she sustained during the fall, she also broke her right arm. Her cast has been removed. Glenda’s doctor has cleared her for moderate exercise, but not for driving. Before the accident, she volunteered as an adult literacy tutor at the Vickery Meadow Learning Center in Dallas. She is retired and is not physically active.
Please assist Glenda with the following items:

**Physical Activity 101**

Explain why physical activity is important for Glenda's success in her rehabilitation journey.

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

TEACH HER HOW MANY MINUTES OF PHYSICAL ACTIVITY PER WEEK WILL HELP HER TO ACHIEVE BETTER HEALTH. TEACH HER THE MINIMUM AMOUNT OF MINUTES IN ONE SESSION THAT COUNTS AS HEALTHY PHYSICAL ACTIVITY.

Amount of minutes/week: ____________________________
Minimum amount of minutes/week: ____________________

**Teach her the possible risks of physical activity and the definite risks of not being active.**

Possible risks of Physical activity:
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Definite Risks of Inactivity:
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

**Exercise is Medicine**

Explain what this means- give three examples of how exercise can be medicine.
____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________
1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________

Teach her three things that could be reduced if she becomes physically active

1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________

SMART Goals
Teach Glenda what each letter in SMART stands for

S ___________________________
M ___________________________
A ___________________________
R ___________________________
T ___________________________

Help Glenda create a 2 week SMART activity goal that will help her start a physical activity habit. Write SMART goal statement below:
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Barriers
Inform/warn Glenda of some of the main barriers she may face in starting a physical activity program while participating in the Day Neuro program.

1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________
4.  

5.  

6.  

Suggest way to overcome the barriers listed above
1.  

2.  

3.  

4.  

5.  

6.  

Social Support
Inform Glenda of the importance of creating a circle of support around her as she begins to bring physical activity into her rehabilitation.

Give Glenda three examples of how she can create a positive social circle of support around her.

1.  

2.  

3.
APPENDIX B

INFORMED CONSENT
PARTICIPATION EXPLANATION AND CONSENT FORM

PROJECT TITLE: Limiting brain injury disability through a physical activity centered education program

INVESTIGATORS: Laurel Stevens, MS SLP-CCC
Stuart Yablon, MD
Kathy Johnson, MS, PT
Simon Driver, PhD
Megan Christensen
Kelley Irwin
Megan Self
Anne Woolsey

INTRODUCTION:

Before you say that you will be in this research study you need to read this form. It is important for you to understand all the information in this form. This form will tell you what the clinical trial is about and how it will be done. It will tell you about some problems that might happen during the clinical trial. It will also tell you about the good things that might happen for you during the clinical trial. When you read a paper like this to learn about a clinical trial it is called “informed consent.” The people who are doing this clinical trial are giving you very important information about the clinical trial. When you give your consent for something, it is the same as giving your permission. This consent form may contain words that you do not understand. Please talk with one of the doctors or their staff if you have questions. Do not sign this consent form unless all your questions have been answered and you feel comfortable with the information you have read. You will be given a copy of the form to keep.

You are being asked to take part in this study because you have been diagnosed as having a brain injury.

Why Is This Study Being Done?
The purpose of the study is to implement a physical activity centered education (PACE) intervention for individuals with brain injury who are enrolled in the Day Neuro Rehabilitation Program. PACE will educate you about the role of physical activity in your rehabilitation process and will examine your physical activity behaviors and rehabilitation outcomes.

**How Many People Will Take Part In The Study?**

Approximately 150 people will take part in this study at this location.

**What Is Involved In The Study?**

You will be asked to participate in the PACE (Physical activity centered education) program which will be completed as a group as part of your regular rehabilitation. The entire program involves 16 1 hour sessions that will take place twice a week over an 8 week time period (or as long as you are enrolled at Day Neuro). You will have to complete 3 questionnaires and a demographic form immediately before you start and finish the program. In addition, you will be asked to complete the same questionnaires at 3, 6, 9 and 12-months post discharge. Each questionnaire package will take approximately 15-20 minutes to complete.

**How Long Will I Be In The Study?**

*Day Neuro procedure:* Within the first week of the Day Neuro program, a 15-20 minute time period will be scheduled for you to complete the questionnaire package. During this time you will be asked to complete a demographic form and 3 questionnaires including measures of self-efficacy to be active, intention to change your physical activity behaviors, and your rehabilitation outcomes.

*Outpatient procedure:* After discharge from the Day Neuro program, you will be contacted at 3, 6, 9, and 12 months for follow-up assessments, either by telephone, or through e-mail. At each follow-up period you will complete the same questionnaire packets administered during the Day Neuro procedure. You have two choices to complete the questionnaires at the follow-up assessments

1. If you choose to be contacted through e-mail for your follow up you will be sent the questionnaires to finish online.
2. If you choose to be contacted by telephone the questionnaires will be read to you by a research assistant at that time.

How would you like to be contacted for the 3, 6, 9 and 12 month follow up? (Circle one):

Phone E-mail

You will receive a telephone call reminding you about your follow-up questionnaires two weeks before the due date.
You can stop taking part in this study at any time.

**What Are The Risks of The Study?**

There is minimal risk of emotional distress to you for taking part in this study. Your alternative is not to take part in this study.

**What About Confidentiality?**

You have a right to privacy. This means that all the information about you from this study will only be shown to the people working on the study. The results of this study may be published in a scientific book or journal. If this is done, your name will not be used. All information about you from this research project will be kept in a locked office or other locked area. Information that is kept on computers will be kept safe from access by people who should not see it.

The privacy law requires that Baylor Research Institute get your permission before giving any of your health information to other people. There are people who need to review your information to make sure the study is done correctly. These people may look at or copy your information while they are doing this review. When you sign this form you give permission to Baylor Research Institute to give other people information about your health as needed for the research project. These groups include people who work for Baylor Research Institute (including the Institutional Review Board), the US Food and Drug Administration, the Office for Human Research Protections and the Association for the Accreditation of Human Research Protection Programs. This also includes the following groups of people who are working with the sponsor of the study: Megan Christensen, Megan Self, Kelley Irwin, Anne Woolsey, and Simon Driver, PhD of the University of North Texas. Even though we usually remove your name from the information, the people who get this information may be able to figure out who you are. The kinds of health information that might be given to these people include results from lab tests or other tests like x-rays. This information might also be notes written by your doctor from your medical record or notes written by your doctor asking for tests to be done on you.

You do not have to give this permission and it is all right to refuse to sign this form. Your doctor will still treat you and your insurance company will still pay your medical bills (according to their policy) even if you do not give your permission for us to release this information. However, since it is important for the people listed above to have access to your information, if you do not sign this form, you cannot be in the research study.

If you give permission to Baylor Research Institute to give other people information about your health and the other people are not part of the group that must obey this law, your health information will no longer be protected by the privacy law. However, we will take all reasonable measures to protect your information from being misused.

If you change your mind and later want to withdraw your permission, you may do so. You must notify Baylor Research Institute in writing at 3310 Live Oak, Suite 501, Dallas, TX 75204.
you decide to do this, it will not apply to information that was given before you withdrew your permission.

You may not be allowed to look at your health information during this study. However, at a later time, you will be able to look at this information. This later time will be sometime after the study is completed.

Unless permission is withdrawn, this permission will expire at the end of the research study.

What Are the Costs?
There are no additional costs to your participation in the study.

Will I Be Paid For Taking part in This Study?
You will not be paid for participating in the study.

What are My Rights As a Participant?
Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. If you agree to take part and then decide against it, you can withdraw for any reason. Deciding not to be in the study, or leaving the study early, will not result in any penalty or loss of benefits that you would otherwise receive.

We will tell you about any new information that may affect your health, welfare, or willingness to stay in this study.

All of the people working on the project must be careful not to carelessly harm you. If you are hurt during this project, you have the right to seek legal counsel. Nothing in this consent form takes away that right if you are hurt during this research.

Whom Do I Call If I have Questions or Problems?
If you have questions about the study or have a research-related injury, contact Laurel Stevens at 214-820-9327.

For concerns, complaints or questions about your rights as a research subject or if you simply wish to speak with someone who is not a part of the research staff, contact Lawrence R. Schiller, M.D., IRB Chair, at 214-820-9327.

Statement of Person Obtaining Consent:
I have explained to ________________ the purpose of the research project, the procedures required and the possible risks and benefits to the best of my ability. They have been encouraged to ask questions related to taking part.

____________________________________ _________________  ____________
Signature of Person Obtaining Consent   Date     Time

Confirmation of Consent by Research Subject:

You are making a decision about being in this research study. You will be asked to give your written consent if you want to be in the study. Giving consent is like giving permission. You should not give your permission to be in this study until you have read and understood all the pages in this form. If you cannot read, then someone can read the form to you. Make sure that all your questions about this research project have been answered before you sign this form. When you sign this form, you are giving your permission to be in the study. By signing this form, you have not given up any of your legal rights or released anyone from liability for negligence.

______________________________ has explained to me the purpose of the research project, the study procedures that I will have, and the possible risks and discomforts that may happen. I have read (or have been read) this consent form. I have been given a chance to ask questions about the research study and the procedures involved. I believe that I have enough information to make my decision. I have also been told my other options. To the best of my knowledge, I am not in any other medical research. Therefore, I agree to give my consent to take part as a subject in this research project.

___________________________________  _________________  ___________
Signature of Subject     Date     Time
(or legally authorized representative) only include this line if the IRB has approved this study for LAR consent

___________________________________  _________________  ___________
Signature of Witness (short form process only)     Date     Time
APPENDIX C

DEMOGRAPHIC QUESTIONNAIRE
Name: ______________________________

Date of Birth: _______ Age: _______
Gender: _________

Height: _______ Weight: _______

Date of injury: ____/_____/_____

How did the injury occur: ____________________________________

Where do you reside (preinjury)?
City, State: ________________________________

What is your primary language?
  o  English
  o  Spanish
  o  Other _____________

What is your current marital status?
  o  Divorced
  o  Living with another
  o  Married
  o  Separated
  o  Single
  o  Widowed
  o  Would rather not say

If you have children, how many children do you have?
_____________________________________(include age)

How many children under the age of 16 year old live in your household?
  o  None
  o  1
  o  2
  o  3
  o  4 or more

How would you classify yourself?
  o  Arab
  o  Asian/Pacific Islander
  o  Black
  o  Caucasian/White
  o  Hispanic
  o  Indigenous or Aboriginal
  o  Latino
  o  Multiracial
  o  Would rather not say
  o  Other _____________
What is the highest level of education you have completed?
- Grammar school
- High school or equivalent
- Vocational/technical school (2 year)
- Some college
- Bachelor’s Degree
- Master’s Degree
- Doctoral Degree
- Professional Degree (MD, JD, etc.)

Which of the following best describes the area you live in?
- Urban
- Suburban
- Rural

How much time do you usually spend sitting or reclining on a typical day?
PreInjury (Hours:Minutes) __________
Postinjury (Hours:Minutes) __________

In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?
PreInjury (# of days): ________________
Postinjury (# of days): ________________

Which of the following best describes your role in industry (preinjury)?
- Upper management
- Middle management
- Junior management
- Administration staff
- Support staff
- Student
- Trained professional
- Skilled laborer
- Consultant
- Temporary employee
- Researcher
- Self-employed
- Other: ________________

What is your current household income in U.S. dollars (preinjury)?
- Under $10,000
- $10,000-$19,999
- $20,000-$29,000
- $30,000-$39,000
- $40,000-$49,000
- $50,000-$74,000
- $75,000-$99,000
- $100,000-$150,000
- Over $150,000
- Would rather not say
Pain Numeric: Please circle the number below that describes your pain in the past 2 weeks.

During the past 30 days, for about how many days did pain make it hard for you to do your usual activities, such as self-care, work, or recreation?
- _ _ = Number of days
- None
- Don’t know
- Refused

Because of any impairment or health problem, do you need the help of other persons with your personal care needs, such as eating, bathing, dressing, or getting around the house?
- Yes
- No
- Don’t know
- Refused

Because of any impairment or health problem, do you need the help of other persons in handling your routine needs, such as everyday household chores, doing necessary business, shopping, or getting around for other purposes?
- Yes
- No
- Don’t know

Would you say that in general your health is?
- Excellent
- Very good
- Good
- Fair
- Poor
- DK/NS
- Refused

To be completed by BIR/UNT Clinician
<table>
<thead>
<tr>
<th>Test</th>
<th>Score/Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIM physical score:</td>
<td></td>
</tr>
<tr>
<td>FIM cognitive score:</td>
<td></td>
</tr>
<tr>
<td>FIM total:</td>
<td></td>
</tr>
<tr>
<td>FIM efficiency:</td>
<td></td>
</tr>
<tr>
<td>Mobility:</td>
<td>Chair, walker, cane, independent</td>
</tr>
<tr>
<td>Apathy Evaluation score:</td>
<td></td>
</tr>
<tr>
<td>Awareness Questionnaire:</td>
<td></td>
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<tr>
<td>Trail Making Test score:</td>
<td></td>
</tr>
<tr>
<td>Hopkins Verbal Learning Test:</td>
<td></td>
</tr>
<tr>
<td>MPAI-4:</td>
<td>-abilities</td>
</tr>
<tr>
<td></td>
<td>-participation</td>
</tr>
<tr>
<td></td>
<td>-adjustment</td>
</tr>
<tr>
<td>Total MPAI-4 -</td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Scale:</td>
<td></td>
</tr>
<tr>
<td>Eyes:</td>
<td></td>
</tr>
<tr>
<td>Verbal:</td>
<td></td>
</tr>
<tr>
<td>Motor:</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

PACE QUESTIONNAIRES
Mayo-Portland Adaptability Inventory – 4 (Muriel D. Lezak, PhD, ABPP & James F. Malec, PhD, ABPP Malec, J. F., & & Thompson, J. N. (1994). Relationship of the Mayo-Portland Adaptability Inventory to functional outcome and cognitive performance measures. *Journal of Head Trauma Rehabilitation, 9*, 1-15). was used in accordance with publication permissions authorized by copyright holders, Drs. Malec and Lezak. The author of this study complied with the following stipulation for use of this instrument: The MPAI-4 may be downloaded from the COMBI web site, copied, and used without fee or other charge. However, distribution or sale of the MPAI-4, related materials developed by Drs. Malec and Lezak, and previous versions for profit, fee, barter, or trade is expressly forbidden.
Exercise: Self-Efficacy

This part looks at how confident you are to exercise when other things get in the way. Read the following items and enter in the box the number that best expresses how each item relates to you in your leisure time.

Please answer using the following 5-point scale:

1= Not at all confident
2= Somewhat confident
3= Moderately confident
4= Very Confident
5= Completely confident

How confident am I to exercise when...

Negative Affect
I am under a lot of stress.
1 2 3 4 5

Excuse Making
I feel I don’t have the time.
1 2 3 4 5

Must Exercise Alone
I have to exercise alone.
1 2 3 4 5

Inconvenient to Exercise
I don’t have access to exercise equipment.
1 2 3 4 5

Resistance from Others
I am spending time with friends or family who do not exercise
1 2 3 4 5

Bad Weather
It’s raining or snowing.
1 2 3 4 5
Exercise: Stages of Change- Short

Regular Exercise is any *planned* physical activity (e.g., brisk walking, aerobics, jogging, bicycling, swimming, rowing, etc.) performed to increase physical fitness. Such activity should be performed 3 to 5 times per week for 20-60 minutes per session. Exercise does not have to be painful to be effective but should be done at a level that increase your breathing rate and causes you to break a sweat.

*Question: Do you exercise regularly according to that definition?*
*Please check the box next to the answer that best describes the answer to the above question.*

- Yes, I have been for **MORE than 6 months**.
- Yes, I have been for **LESS than 6 months**.
- No, but I intend to in the **next 30 days**.
- No, but I intend to in the **next 6 months**.
- No, and I do **NOT** intend to in the **next 6 months**.

Exercise: Amount and Intensity

We are interested in two types of physical activity: vigorous and moderate. Vigorous activities (examples: running, aerobics, heavy yard work) cause large increases in breathing or heart rate while moderate activities (examples: brisk walking, bicycling, vacuuming, gardening) cause small increases in breathing or heart rate.

*Question: In a usual week, do you exercise at a moderate/vigorous level according to that definition?*
*Please check the box next to the answer that best describes the answer to the above question.*

- Yes, **AT WORK**, I **do MODERATE** level activities for at least 10 minutes at a time.
- Yes, **AWAY FROM WORK**, I **do MODERATE** level activities for at least 10 minutes at a time.
- Yes, **AT WORK**, I **do VIGOROUS** level activities for at least 10 minutes at a time.
• Yes, AWAY FROM WORK, I do VIGOROUS level activities for at least 10 minutes at a time.

• No, AWAY FROM WORK, I do not do MODERATE or VIGOROUS level activities for at least 10 minutes at a time.

Question: How many days per week do you do these moderate activities for at least 10 minutes at a time?

= Days per week

Question: How many days per week do you do these vigorous activities for at least 10 minutes at a time?

= Days per week
Mayo-Portland Adaptability Inventory – 4

Muriel D. Lezak, PhD, ABPP & James F. Malec, PhD, ABPP

Name: __________________________________________________    Clinic #
__________________________________    Date ______________________

Person reporting (circle one):         Single Professional        Professional Consensus

Person with brain injury        Significant Other:

Below each item, circle the number that best describes the level at which the person being evaluated experiences problems. Mark the greatest level of problem that is appropriate. Problems that interfere rarely with daily or valued activities, that is, less than 5% of the time, should be considered not to interfere. Write comments about specific items at the end of the rating scale.

For Items 1-20, please use the rating scale below:

<p>| | | | | | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>1 Mild problem but does not interfere with activities; may use assistive device or medication</td>
<td>2 Mild problem; interferes with activities 5-24% of the time</td>
<td>3 Moderate problem; interferes with activities 25-75% of the time</td>
<td>4 Severe problem; interferes with activities more than 75% of the time</td>
</tr>
</tbody>
</table>

**PART A. Abilities**

1. **Mobility:** Problems walking or moving; balance problems that interfere with moving about
   - 0
   - 1
   - 2
   - 3
   - 4

2. **Use of Hands:** Impaired strength or coordination in one or both hands
   - 0
   - 1
   - 2
   - 3
   - 4

3. **Vision:** Problems seeing; double vision; eye, brain or nerve injuries that interfere with seeing
   - 0
   - 1
   - 2
   - 3

4. **Audition:** Problems hearing; ringing in the ears
   - 0
   - 1
   - 2
   - 3
   - 4

5. **Dizziness:** Feeling unsteady, dizzy, light-headed
   - 0
   - 1
   - 2
   - 3

6. **Motor Speech:** Abnormal clearness or rate of speech; stuttering
   - 0
   - 1
   - 2
   - 3

7A. **Verbal Communication:** Problems expressing or understanding language
   - 0
   - 1
   - 2
   - 3

7B. **Nonverbal Communication:** Restricted or unusual gestures or facial expressions; talking too much or not enough; missing nonverbal cues from others
   - 0
   - 1
   - 2
   - 3

8. **Attention/Concentration:** Problems ignoring distractions, shifting attention, keeping more than one thing in mind at a time
   - 0
   - 1
   - 2
   - 3

9. **Memory:** Problems learning and recalling new information
   - 0
   - 1
   - 2
   - 3

10. **Fund of Information:** Problems remembering information learned in school or on the job; difficulty remembering information about self and family from years ago
    - 0
    - 1
    - 2
    - 3

11. **Novel Problem-Solving:** Problems thinking up solutions or picking the best solution to new problems
    - 0
    - 1
    - 2
    - 3

12. **Visuospatial Abilities:** Problems drawing, assembling things route-finding, being visually aware on both the left and right sides
    - 0
    - 1
    - 2
    - 3

154
### PART B. Adjustment

| 13. Anxiety: Tense, nervous, fearful, phobias, nightmares, flashbacks of stressful events |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 14. Depression: Sad, blue, hopeless, poor appetite, poor sleep, worry, self-criticism |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 15. Irritability, anger, aggression: Verbal or physical expressions of anger |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 16. Pain and headache: Verbal and nonverbal expressions of pain; activities limited by pain |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 17. Fatigue: Feeling tired; lack of energy; tiring easily |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 18. Sensitivity to mild symptoms: Focusing on thinking, physical or emotional problems attributed to brain injury; rate only how concerned or worry about these symptoms affects current functioning over and above the effects of the symptoms themselves |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 19. Inappropriate social interaction: Acting childishly, silly, rude, behavior not fitting for time and place |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| 20. Impaired self-awareness: Lack of recognition of personal limitations and disabilities and how they interfere with everyday activities and work or school |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

**Use scale below to rate item #21**

| 21. Family/significant relationship: Interactions with close others; describe stress within the family or those closest to the person with brain injury; “family functioning” means cooperating to accomplish those tasks that need to be done to keep the household running |
|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 |

| Normal stress within family or other close network of relationships |
|---|---|---|---|---|
| 1 | Mild stress that does not interfere with family functioning |
| 2 | Mild stress that interferes with family functioning 5-24% of the time |
| 3 | Moderate stress that interferes with family functioning 25-75% of the time |
| 4 | Severe stress that interferes with family functioning more than 75% of the time |

---

### PART C. Participation

| 22. Initiation: Problems getting started on activities without prompting |
|---|---|---|---|---|
| 0 None |
| 1 Mild problem but does not interfere with activities; may use assistive device or medication |
| 2 Mild problem; interferes with activities 5-24% of the time |
| 3 Moderate problem; interferes with activities 25-75% of the time |
| 4 Severe problem; interferes with activities more than 75% of the time |

| 23. Social contact with friends, work associates, and other people who are not family, significant others, or professionals |
|---|---|---|---|---|
| 0 Normal involvement with others |
| 1 Mild difficulty in social situations but maintains normal involvement with others |
| 2 Mildly limited involvement with others (75-95% of normal interaction for age) |
| 3 Moderately limited involvement with others (25-74% of normal interaction for age) |
| 4 No or rare involvement with others (less than 25% of normal interaction for age) |

| 24. Leisure and recreational activities |
|---|---|---|---|---|
| 0 Normal participation in leisure activities for age |
| 1 Mild difficulty in these activities but maintains normal participation |
| 2 Mildly limited participation (75-94% of normal participation for age) |
| 3 Moderately limited participation (25-74% of normal interaction for age) |
| 4 No or rare participation (less than 25% of normal interaction for age) |

| 25. Self-care: Eating, dressing, bathing, hygiene |
|---|---|---|---|---|
| 0 Independent completion of self-care activities |
| 1 Mild difficulty, occasional omissions or mildly slowed completion of self-care; may use assistive device or |
| 2 Requires a little assistance or supervision from others (5-24% of the time) including frequent prompting |
| 3 Requires moderate assistance or supervision form others (25-75% of the time) |
| 4 Requires extensive assistance or supervision from others (more than 75% of the time) |
## 26. Residence:
Responsibilities of independent living and homemaking (such as, meal preparation, home repairs and maintenance, personal health maintenance beyond basic hygiene including medication management) but not including managing money (see #29)

<table>
<thead>
<tr>
<th>0</th>
<th>Independent; living without supervision or concern from others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Living without supervision but others have concerns about safety or managing responsibilities</td>
</tr>
<tr>
<td>2</td>
<td>Requires a little assistance or supervision from others (5-24% of the time)</td>
</tr>
<tr>
<td>3</td>
<td>Requires moderate assistance or supervision from others (25-75% of the time)</td>
</tr>
<tr>
<td>4</td>
<td>Requires extensive assistance or supervision from others (more than 75% of the time)</td>
</tr>
</tbody>
</table>

## 27. *Transportation:
Independent in all modes of transportation including independent ability to operate a personal motor vehicle

<table>
<thead>
<tr>
<th>0</th>
<th>Independent in all modes of transportation, but others have concerns about safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requires a little assistance or supervision from others (5-24% of the time); cannot drive</td>
</tr>
<tr>
<td>2</td>
<td>Requires moderate assistance or supervision from others (25-75% of the time); cannot drive</td>
</tr>
<tr>
<td>3</td>
<td>Requires extensive assistance or supervision from others (more than 75% of the time); cannot drive</td>
</tr>
</tbody>
</table>

## 28A. *Paid Employment:
Rate either item 28A or 28B to reflect the primary desired social role. Do not rate both. Rate 28A if the primary social role is paid employment. If another social role is primary, rate only 28B. For both 28A and 28B, “support” means special help from another person with responsibilities (such as, a job coach or shadow, tutor, helper) or reduced responsibilities. Modifications to the physical environment that facilitate employment are not considered as support.

### 0
Full-time (more than 30 hrs/wk) without support

| 1 | Part-time (3 to 30 hrs/wk) without support |
| 2 | Full-time or part-time with support |
| 3 | Sheltered work |
| 4 | Unemployed; employed less than 3 hours per week |

## 28B. *Other Employment:
Involved in constructive, role-appropriate activity other than paid employment. Check one to indicate primary desired social role:  Childbearing/care-giving  Homemaker, no childbearing or care-giving  Student  Volunteer  Retired (Check retired only if over 60; if unemployed, retired as disabled and under age 60, indicate “Unemployed” for item 28A.)

<table>
<thead>
<tr>
<th>0</th>
<th>Full-time (more than 30 hrs/wk) without support; full-time course load for students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Part-time (3 to 30 hrs/wk) without support</td>
</tr>
<tr>
<td>2</td>
<td>Full-time or part-time with support</td>
</tr>
<tr>
<td>3</td>
<td>Activities in a supervised environment other than a sheltered workshop</td>
</tr>
<tr>
<td>4</td>
<td>Inactive; involved in role-appropriate activities less than 3 hours per week</td>
</tr>
</tbody>
</table>

## 29. Managing Money and Finances:
Shopping, keeping a check book or other bank account, managing personal income and investments; if independent with small purchases but not able to manage larger personal finances or investments, rate 3 or 4.

<table>
<thead>
<tr>
<th>0</th>
<th>Independent, manages small purchases and personal finances without supervision or concern from others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manages money independently but others have concerns about larger financial decisions</td>
</tr>
<tr>
<td>2</td>
<td>Requires a little help or supervision (5-24% of the time) with large finances; independent with small purchases</td>
</tr>
<tr>
<td>3</td>
<td>Requires moderate help or supervision (25-75% of the time) with large finances; some help with small purchases</td>
</tr>
<tr>
<td>4</td>
<td>Requires extensive help or supervision (more than 75% of the time) with large finances; frequent help with small purchases</td>
</tr>
</tbody>
</table>

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*Note: The table above is a simplified representation of the text content provided. For a more detailed understanding, please refer to the full text.*
REFERENCES


Centers for Disease Control and Prevention. (2010). *Core violence and injury prevention program* (core VIPP). Retrieved from


