LIMITING DISABILITY POST-BRAIN INJURY THROUGH A PHYSICAL ACTIVITY CENTERED EDUCATION PROGRAM

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Thesis Prepared for the Degree of

MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

August 2011

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Irwin, Kelley. *Limiting disability post-brain injury through a physical activity centered education program*. Master of Science (Kinesiology), August 2011, 144 pp., 7 tables, 4 illustrations, reference list, 63 titles.

Brain injury (i.e., traumatic brain injury, stroke) is a considerable public health issue due to complicated outcomes of the injury, increasing incidence, and high costs linked with medical treatment. Rehabilitation centers are challenged to help individuals manage the resultant associated conditions and prevent secondary and chronic conditions. 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, PA is not included in the rehabilitation program for individuals with a brain injury, indicating a gap in the services provided. Consequently, the purpose of this study was to create and implement a physical activity centered education (PACE) program within an outpatient rehabilitation program. PACE consisted of an 8-week (16 session) program which aimed to (1) increase PA self-efficacy, (2) increase intention to change PA behaviors, (3) increase amount of PA completed regularly, and (4) promote positive rehabilitation outcomes. Based on previous research it was hypothesized that participation in PACE would result in (1) increased PA self-efficacy, (2) forward progression in intention to change PA behaviors, (3) increased amount of PA completed, and (4) improved rehabilitation outcomes (i.e., abilities, adjustment, participation). The PACE program resulted in an average increase of 16.1% in participants’ PA self-efficacy (effect size [ES] = 0.41), an increase from three of nine participants at pre-test to six of nine participants at post-test reporting to be in a stage of change in which they are most likely to be successful in regular PA participation (i.e., action or maintenance), and a comparable improvement in MPAI-4 scores (rehabilitation outcomes) after discharge to a rehabilitation
program without a PA education component. In conclusion, the PACE program can improve PA self-efficacy, intention to change PA behaviors, and short-term rehabilitation outcomes.
ACKNOWLEDGEMENTS

It is a pleasure to thank those who made this thesis possible. First and foremost, I am tremendously grateful for my supervisor, Dr. Simon Driver, whose enthusiasm, constructive comments, and support guided me throughout the project. He passed his love of helping those with disabilities on to me, and has become my advocate and friend.

I would also like to thank the members of my supervisory committee, Dr. Christy A. Greenleaf, Dr. Allen Jackson, and Laurel Stevens for offering their assistance and time in order to promote my success.

It is an honor for me to thank Baylor Institute of Rehabilitation for allowing me to work with its patients, staff, and therapists.

Special thanks are extended to my family, my colleagues at the University of North Texas, and my friends for their enduring support and understanding through this process.

Finally, the one dearest to my heart, thank you to my husband Jeremy for understanding the late nights spent researching and writing, the tired days after those late nights, and the importance of this project to me. He has been my encourager, motivator, and biggest fan in completing this thesis and I cannot express my gratitude enough.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES AND FIGURES</td>
<td>v</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Brain Injury as a Public Health Problem</td>
<td>3</td>
</tr>
<tr>
<td>Developing an Effective Health Promotion Program</td>
<td>5</td>
</tr>
<tr>
<td>Preliminary Research for PACE Development</td>
<td>6</td>
</tr>
<tr>
<td>Curriculum Development and Behavior Change</td>
<td>9</td>
</tr>
<tr>
<td>Theoretical Framework</td>
<td>11</td>
</tr>
<tr>
<td>Previous Research on the Efficacy of Physical Activity Interventions</td>
<td>14</td>
</tr>
<tr>
<td>METHODOLOGY</td>
<td>18</td>
</tr>
<tr>
<td>Participants</td>
<td>18</td>
</tr>
<tr>
<td>Procedure</td>
<td>19</td>
</tr>
<tr>
<td>PACE Development</td>
<td>22</td>
</tr>
<tr>
<td>Measures</td>
<td>24</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>28</td>
</tr>
<tr>
<td>RESULTS</td>
<td>29</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>31</td>
</tr>
<tr>
<td>Future Research</td>
<td>34</td>
</tr>
<tr>
<td>Limitations</td>
<td>36</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>38</td>
</tr>
<tr>
<td>Appendices</td>
<td></td>
</tr>
<tr>
<td>A. PACE MATERIALS</td>
<td>45</td>
</tr>
<tr>
<td>B. INFORMED CONSENT NOTICE</td>
<td>130</td>
</tr>
<tr>
<td>C. DEMOGRAPHIC QUESTIONNAIRE</td>
<td>136</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>140</td>
</tr>
</tbody>
</table>
### LIST OF TABLES AND FIGURES

#### Tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Components of a PA Intervention</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Interaction of PACE Components with Behavioral Theories</td>
<td>39</td>
</tr>
<tr>
<td>3.</td>
<td>Summary of PACE Content</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>Participant Demographics</td>
<td>41</td>
</tr>
<tr>
<td>5.</td>
<td>Participant Characteristics</td>
<td>42</td>
</tr>
<tr>
<td>6.</td>
<td>MPAI-4 Results</td>
<td>43</td>
</tr>
<tr>
<td>7.</td>
<td>Exercise Self-Efficacy Results</td>
<td>43</td>
</tr>
<tr>
<td>8.</td>
<td>Exercise Stage of Change Results</td>
<td>44</td>
</tr>
</tbody>
</table>

#### Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The intervention puzzle (USDHHS, 1999)</td>
<td>5</td>
</tr>
<tr>
<td>2.</td>
<td>Bandura’s social cognitive theory (Bandura, 1986)</td>
<td>12</td>
</tr>
<tr>
<td>3.</td>
<td>The stages of behavior change and the transtheoretical model (Prochaska &amp; DiClemente, 1983)</td>
<td>13</td>
</tr>
</tbody>
</table>
INTRODUCTION

Brain injury, encompassing traumatic brain injury (TBI) and stroke, is a public health issue due to increased incidence, complicated and varied conditions, and high costs associated with rehabilitation and medical services (Faul, Wald, & Coronado, 2010; Finkelstein, Corso, & Miller, 2006; Kalpakjian, Lam, Toussaint, & Hansen Merbitz, 2004). An estimated 1.7 million individuals in the United States experience a TBI every year, of which 275,000 are hospitalized, and 52,000 die (Faul et al., 2010). Each year in the U.S. 795,000 individuals experience a stroke and an estimated 20% of individuals who survive a stroke eventually have another (Lloyd-Jones, Adams, Carnethon, et al., 2009). Brain injury can occur at all ages, although general age differences can be seen between TBI and stroke. TBI occurs most often within the age groups of 0-4 years, 15-19 years, and over 65 years of age, with adults over the age of 75 demonstrating the highest incidence of hospitalization and death related to TBI (Faul et al., 2010). Strokes occur most often in older adults, with around 75% occurring in individuals over the age of 65 (Heron et al., 2009).

Traumatic and acquired brain injuries are caused by different mechanisms. TBI is caused when the skull violently hits another object or when an object penetrates the skull and brain tissue (Langlois, Rutland-Brown, & Thomas, 2004). TBI is primarily caused by a fall (35.2% of cases), followed by motor vehicle accident (17.3%), event in which an individual is struck by/against an object (16.5%), or assault (10%) (Faul et al., 2010). A stroke is caused by a lack of blood supply to an area of the brain due to a blood clot, causing damage to brain tissue (Heron et al., 2009). Risk factors for the formation of blood clots include high blood pressure or cholesterol, heart disease, and being overweight or obese (Heron et al., 2009). The impairments resulting from brain injury can range from mild to extremely severe due to the individuality of...
the brain, and can impact physical, cognitive, and psychosocial functioning (National Institute of Neurological Disorders and Stroke, 2002 Feb.). Numerous associated conditions (e.g. seizures, impaired reasoning, apraxia, aphasia) occur post brain injury, and individuals who have experienced a brain injury are more likely to experience a multitude of secondary conditions (National Institute of Neurological Disorders and Stroke, 2002 Feb.). Secondary conditions are not a direct outcome of a primary disability, but are health conditions developed as a result of lifestyle changes related to the disability. Secondary conditions that may affect individuals with brain injury include obesity, depression, pain, fatigue, and increased risk for epilepsy or seizures (Rimmer & Rowland, 2008). Individuals with brain injury also have a greater chance of developing chronic conditions such as diabetes, hypertension, or cardiovascular disease.

The combination of associated, secondary, and chronic conditions creates a negative spiral of health for individuals with brain injury, which leads to high health care costs. In 1998 it was estimated that the average lifetime cost of a TBI ranged from $600,000 to $1,875,000 per individual (National Institute of Health, 1998). However, this figure is now dated and does not include lost time or wages, thus costs are likely to be far greater in the present day. A more recent estimate of the annual cost is $60 billion (Finkelstein et al., 2006). Comparably, stroke is estimated to cost $68.9 billion each year in the United States (Lloyd-Jones et al., 2009). The United States spends an estimated $128.9 billion on direct and indirect costs associated with brain injury every year, demonstrating the need for interventions to improve health and reduce health care costs post injury.

One of the major goals of rehabilitation is to help individuals manage their associated conditions and prevent secondary or chronic conditions from occurring (Rimmer & Rowland, 2008). A mode of rehabilitation that research has demonstrated to reach this outcome is health
promotion programs which incorporate physical activity (PA) (Lollar & Crews, 2003; Rimmer & Rowland, 2008). PA can be considered planned exercise (e.g., swimming, weight training, walking) or activities of daily living (ADLs) (e.g., cleaning the house, home maintenance, lawn care) (U.S. Department of Health and Human Services [USDHHS], 2009) that results in greater energy expenditure than rest. PA is a leading indicator of health and is linked with a decreased risk of mortality and morbidity (USDHHS, 2008). Although some current brain injury rehabilitation programs include PA in the form of walking, balance training, and strengthening classes, they do not include education on why PA is important, how to continue PA after rehabilitation, and the risks associated with inactivity. This lack of PA education indicates a gap in the services provided. Consequently, the present study designed and implemented a PA centered education (PACE) curriculum for use within an 8-week outpatient rehabilitation program for individuals with a recent brain injury.

Brain Injury as a Public Health Problem

Brain injury is a significant public health issue that has mainly been addressed from a prevention standpoint (e.g., the CDC’s Core Violence and Injury Prevention Program focusing on prevention of TBI) (Centers for Disease Control and Prevention, 2010). Healthy People 2010 was the first federal initiative to approach disability from another point of view. It discussed the role of public health programs in the management of associated conditions and the prevention of secondary and chronic conditions for individuals with disabilities (Lollar & Crews, 2003). This document highlights common misconceptions about the role of public health in disability (e.g., individuals with disabilities always have a poor health status, public health initiatives should only aim to prevent disability) and outlines objectives related to health issues of individuals
living with disabilities (e.g., reduce the number of people in group care facilities, increase the availability of health promotion programs (HPP) and facilities that are fully accessible for those with disabilities) (USDHHS, 2000). Healthy People 2020 was recently released and includes many similar objectives, yet places more emphasis on barriers to participation and barriers to health and wellness programs for individuals with disabilities (USDHHS, 2010). HPPs that are incorporated into the rehabilitation process for individuals with brain injury currently include information on nutrition, adjustment to life with a disability, and spirituality; however, education on the importance of PA is not included. PA is an important component of the rehabilitation process for individuals with brain injury as it is strongly related to many positive rehabilitation outcomes (e.g., functional ability, independent living, quality of life) (Lollar & Crews, 2003; Rimmer & Rowland, 2008). For example, PA can be instrumental in pain management and the maintenance of physical function, which results in greater independence for individuals with brain injury (Goodwin & Compton, 2004; Jankowski & Sullivan, 1990). In addition, mood and depression levels can be positively impacted by PA (Driver & Ede, 2009), and regular activity helps to prevent cognitive decline in individuals with brain injury (USDHHS, 2008). The amount of activity that provides substantial health benefits for adults has been outlined by the U.S. Department of Health and Human Services (USDHHS) as 150 minutes of moderate intensity PA or 75 minutes of vigorous intensity PA per week, and muscle strengthening exercises targeting all major muscle groups twice per week (USDHHS, 2009). These guidelines are the same for individuals with disabilities with the added clause that if individuals cannot meet the guidelines, they should engage in as much PA as allowed by their abilities, avoiding sedentary lifestyles (USDHHS, 2008). Overall, regular PA that complies with these guidelines can help prevent secondary and chronic conditions linked with brain injury, which supports the purpose of HPPs
and Healthy People 2010 and reduces the cost of healthcare as a result (Rimmer & Rowland, 2008; USDHHS, 2008). However, HPPs must be appropriately designed and implemented to facilitate behavior change.

Developing an Effective Health Promotion Program

The purpose of a HPP is to increase the likelihood that individuals will participate in desired health behaviors by increasing self-efficacy, support, motivation, and readiness to change (USDHHS, 1999). For example, a PA education HPP is intended to increase individuals’ adoption of and adherence to PA behaviors. This is achieved through appropriately designed and implemented HPPs that (1) increase an individual’s intention to change behavior, and (2) promote an environment supportive of behavior change (see Figure 1). The USDHHS provides guidelines for creating HPPs that are based on a comprehensive review of the PA intervention literature (Kahn et al., 2002).

![Figure 1. The intervention puzzle (USDHHS, 1999).](image-url)
The first step to implementing a HPP is choosing a target population (e.g., individuals with a brain injury) and creating an ‘audience profile’ that describes the population in terms of its socio-economic status, needs, common barriers, and lifestyle (e.g., demographic data, current behaviors, previous knowledge, social network). For a HPP focusing on PA education, the audience profile should include information on the target population’s previous knowledge of PA, barriers faced to PA (e.g., transportation, cost), and motive for PA participation (e.g., improve functional independence, positive health outcomes). An effective way to create an audience profile is through the use of questionnaires and focus groups to help identify a population’s expectations, intentions, and perceived barriers and motivations (USDHHS, 1999).

Preliminary Research for PACE Development

Previous research has been instrumental in the development of the audience profile for the PACE program. Data was collected on the target group’s (1) current PA behaviors, (2) PA barriers faced, (3) current beliefs and attitudes regarding PA, (4) current PA level or intention to become involved in PA, and (5) current knowledge of the impact of PA on health and rehabilitation outcomes. This information was gathered through a three-step process, beginning with assessing the group’s current level of PA.

Driver and colleagues (Driver, Ede, Dodd, Warren, & Stevens, 2010) investigated self-reported PA level, barriers to PA participation, importance placed on PA, and readiness to be active in 28 individuals with a brain injury (TBI) \(M \text{ age} = 44.11, SD = 16.23\). Participants had experienced a brain injury recently \(M = 43\) days prior to testing and were enrolled in a comprehensive outpatient program. Results indicated that participants completed an average of 46 minutes of PA per week although most described themselves as being in the ‘action’ stage of
PA behavior. The action stage is the fourth of five stages of behavior change outlined by the Transtheoretical Model (i.e., precontemplation, contemplation, preparation, action, and maintenance) (Prochaska & DiClemente, 1983), and is used to describe individuals who have consistently participated in the recommended amount of PA per week (e.g., 20-60 minutes of moderate PA three to five times per week) for six months or less. Participants reported experiencing an average of 2.25 out of nine possible barriers, and individuals who reported feeling highly motivated to be active experienced fewer barriers than those who reported low motivation. Overall, 85.7% of participants believed that PA was important, and 73% had a desire to be enrolled in a PA program. Results indicated that individuals with a brain injury do not currently participate in an adequate level of PA but perceived that they were, expressed interested in being active, and perceived few barriers. This study demonstrated that the PACE program should provide information on the recommended weekly amount of PA, the types of activities that are considered PA, and how to set and work towards personal goals in order to increase PA participation. The next study in creating the audience profile expanded the study to long-term outpatients with a brain injury.

Driver (2009) examined self-reported activity level, individual importance placed on PA, and the barriers to PA participation for 192 outpatients who had experienced a traumatic brain injury (TBI) over one year prior to enrollment in the study (M age = 36.27, SD = 7.14). Participants were involved in a long-term outpatient program, and mean time since injury was 3.6 years. A questionnaire was administered to gather demographic information, PA level post injury, barriers to PA participation, and interest in beginning a PA program. Results indicated that participants were not currently active, yet felt PA was important and were interested in becoming active. On average, participants reported completing 45 minutes per week of PA. This
lack of participation could be due to a high number of barriers as individuals reported facing an average of six out of nine possible barriers, which is considerably higher than participants who had recently experienced a brain injury, suggesting that perceived barriers increase with time. The most frequently experienced barriers included lack of personal care attendant to help with exercise, the belief that exercise would not benefit the participant’s condition, the belief that exercise would worsen the participant’s condition, lack of transportation, and the cost of an exercise program. Despite these barriers, participants did not feel that lack of mobility was a relevant barrier and reported feeling motivated to participate in PA. Results from this study indicated that while individuals recognized the importance of PA and were interested in becoming active, current PA levels fell far short of national standards. Consequently, the PACE program must include education on the benefits of PA on rehabilitation outcomes and overall health, as well as guidelines on how to safely participate in PA. The PACE program should include in-depth discussion on the most common barriers experienced with the target population and strategies to overcome these barriers after discharge from the outpatient program. The last step in creating the audience profile involved completing focus groups with the target population to obtain a detailed qualitative understanding of knowledge, intention, and barriers.

A series of focus groups, composed of individuals with brain injury enrolled in a comprehensive outpatient program, were completed to assess current PA knowledge, intention to participate, and common barriers and motivations (Self, Driver, & Stevens, 2010). During the focus groups participants discussed a series of questions related to the knowledge, motivation, intention, and barriers faced for PA participation. Transcriptions of the focus groups were then analyzed to reveal common themes which included a limited knowledge of (1) the health benefits associated with PA, (2) the amount of PA necessary to experience health benefits, (3) the
difference between PA and physical therapy, and (4) the role of PA on their rehabilitation outcomes (Self, Driver, & Stevens, 2010). This study demonstrated that the PACE program must include detailed information on what PA includes, the amount required, and the benefits of activity on general health and rehabilitation outcomes.

As a result of this series of studies, a detailed audience profile (Self, Driver, & Stevens, in press) was developed to better understand the PA behaviors of individuals with a brain injury. Results served as the platform for developing the program goals and curriculum for the PACE program.

*Curriculum Development and Behavior Change*

The next steps in the development of a HPP involves creating program goals and a curriculum that uses behavioral components to increase the likelihood that participants will achieve the program goals (see Figure 2).

First, when creating program goals, perceived barriers and motivations for the target population should be considered. For example, program goals focus on the desired knowledge of PA (e.g., impact of PA on rehabilitation outcomes, amount of PA necessary to experience health benefits) and the specific behaviors participants should engage in after completion of the intervention (e.g., regular PA participation according to USDHHS standards). Second, when creating curriculum for a HPP the concepts that are necessary for the target population to understand in order to achieve the program goals (e.g., health benefits associated with PA, positive impact of PA on rehabilitation outcomes) must be identified. Curriculum contents can be further shaped by comparing these concepts to the gaps in knowledge described by the audience profile. In addition to information about specific health behaviors, strategies to facilitate behavior
change must be included (e.g., goal setting, tracking behavior, self-reward, etc.) (USDHHS, 1999). Several of these steps in HPP development have been followed during the development of the current Physical Activity Centered Education (PACE) program. PACE curriculum was created with an understanding of the theoretical components behind behavior change.

Table 1

*Components of a PA Intervention*

<table>
<thead>
<tr>
<th>Intervention Components</th>
<th>Reason Included</th>
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</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>
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<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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<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>
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<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>
</tr>
<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>
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<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>
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<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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Source: USDHHS, 2008.
Theoretical Framework

Two theoretical frameworks have been used in previous research to facilitate behavior change within a HPP, including the social cognitive theory (SCT) (Bandura, 1986) and the transtheoretical model (Prochaska & DiClemente, 1983). Previous research has adapted the SCT for use in a PA context (Lox & Freehill, 1999; Martin, 2002; McAuley, 1993; McAuley & Blissimer, 2000) and utilized the transtheoretical model to describe changes in PA participation (Dishman, Vandenberg, Motl, & Nigg, 2010; Driver, Ede, Warren, & Stevens, 2009; Kirk, MacMillan, & Webster, 2010; Pekmezi, Barbera, & Marcus, 2010). The SCT was included as a basis for the PACE program because it outlines methods to increase self-efficacy, which is helpful in overcoming barriers that may hinder the adoption and maintenance of PA behaviors (Nahas, Goldfine, & Collins, 2003). The transtheoretical model was included as it depicts how an individual moves from pre-contemplation to maintenance during behavior change and details how to facilitate this progression (Prochaska & DiClemente, 1983).

The SCT describes an individual’s ability to succeed in various situations, and attributes success in achieving PA-related goals to the interrelationship between an individual’s personal, behavioral, and environmental factors. Bandura (1986) considers self-efficacy to be an individual’s confidence in his/her ability to successfully adhere to a specific behavior, and it is among the strongest predictors of behavior change, particularly beginning PA participation and PA adherence (Haworth, Young, & Thornton, 2009; Reuter et al., 2010). If self-efficacy is low, an individual believes that (s)he does not have the ability to overcome barriers that hinder PA participation (e.g., participating in PA when the weather is bad, when feeling stressed). As a result, increasing self-efficacy results in an individual feeling more confident in his/her ability to overcome barriers and participate in regular PA (see Figure 2).
Self-efficacy can be influenced by four antecedents including past performance, social persuasion, vicarious experiences, and psychological states (see Figure 3) (Bandura, 1986). HPPs can incorporate strategies that manipulate these antecedents in an effort to increase the self-efficacy of participants and actual participation. Previous research has shown that individuals with brain injuries face a high number of barriers to PA (Driver et al., 2009; Driver, 2005), resulting in decreased self-efficacy. Consequently, individuals with brain injuries may not engage in PA regularly, contributing to the development of secondary and chronic conditions (e.g., decreased functional strength, decreased endurance) (Rimmer & Rowland, 2008). Since self-efficacy is a determinant of PA participation (Bandura, 1997), increasing self-efficacy in individuals with brain injuries may be particularly effective in increasing PA participation. Repeated efforts to increase self-efficacy are necessary for long-term behavior change to occur, as behavior is often variable and inconsistent (Grodesky, 2008; Prochaska & DiClemente, 1983). The transtheoretical model describes the dynamics of this fluctuation in behavior change.
Figure 3. The stages of behavior change and the transtheoretical model (Prochaska & DiClemente, 1983).

The transtheoretical model depicts behavior changing progressively through a series of five stages of change (i.e., pre-contemplation, contemplation, preparation, action, and maintenance) (see Figure 4) (Prochaska & DiClemente, 1983). Individuals do not simply jump from an early stage in the model to the maintenance stage, but rather move through the stages in order. This progression through the stages is often facilitated with the aid of strategies intended to foster behavior change (e.g., provide knowledge of benefits of change, develop basic skills needed for change, reinforce successes with rewards) (USDHHS, 1999).

The application of theory within the curriculum is crucial to the success of HPPs, as both the SCT and transtheoretical model outline the skills (e.g., goal-setting and problem-solving to increase self-efficacy) and environmental conditions (e.g., overcoming barriers) necessary for
behavior change (see Tables 1 and 2). Discussion will now review previous research that has used the SCT or transtheoretical model to facilitate health behavior change in individuals with disabilities.

Previous Research on the Efficacy of Physical Activity Interventions

Several research studies have shown significant improvements in rehabilitation outcomes and decreases in secondary and chronic conditions for people with disabilities through participation in HPPs that include PA (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; Stuifbergen, Becker, Blozis, Timmerman, & Kullberg, 2003). HPPs that demonstrate the most success empower individuals to enable their environment and teach strategies to overcome barriers to participation in addition to teaching health management (Rimmer & Rowland, 2008).

Ravesloot and colleagues (Ravesloot et al., 2005) examined the effects of the Living Well with a Disability program on the secondary conditions (e.g., pressure sores, depression, urinary tract infection), symptom days (e.g., poor mental or physical health), and health care costs of 188 individuals ($M_{age} = 45$ years, $SD = 13.4$ years) who had been living with a mobility impairment for an average of 17.5 years. The program was based upon the social cognitive models of sense of coherence (Antonovsky, 1979), attribution style (Abramson, Seligman, & Teasdale, 1978), and hope (Snyder, Irving, & Anderson, 1991). Participants completed the program under the supervision of facilitators who led discussions on content (e.g., goal setting, problem solving, depression, communication, physical activity) and directed written activities. A significant decrease in limitation due to secondary conditions was reported after the program, and this effect
was maintained during 2, 4, and 12-month follow-up assessments. The program also resulted in less health care utilization (e.g., hospitalization, medication), equaling a cost savings of $807 per person. These findings demonstrate the ability of well-organized HPPs to positively impact functional ability and significantly lower health care costs.

Stuifbergen et al. (2003) investigated the effects of a wellness intervention for women with multiple sclerosis (MS) on self-efficacy (e.g., in relation to PA, responsible health practices, nutrition), health behaviors (e.g., PA, interpersonal relations, stress management), and quality of life (e.g., physical functioning, pain, role limitation) in 113 women with MS ($M age = 45.79$, $SD = 10.09$). The intervention was based on a conceptual model that describes the effect of barriers, resources, and self-efficacy on health behaviors and outcomes. The intervention consisted of a two-phase program including (1) lifestyle-change classes (e.g., self-assessment of behaviors, resources, and barriers; strategies to increase self-efficacy for health behaviors), and (2) a telephone follow-up for three months. Lifestyle-change classes were presented in a 90-minute session once per week with a double session separated by a lunch break every other Saturday for eight weeks. These classes included topics such as lifestyle adjustment, exercising for fun, and eating healthy. At the conclusion of the lifestyle-change classes, participants received follow-up telephone calls bimonthly from an intervention facilitator who acknowledged their performance accomplishments and encouraged them to continue monitoring goals. Results indicated improvements in self-efficacy, health behaviors, and two aspects of quality of life (QOL) (i.e., pain, mental health) and demonstrated that HPPs including a behavior change component can improve individuals’ long-term health outcomes.

Rimmer et al. (2000) investigated the effectiveness of a 12-week HPP designed for urban African-Americans who had experienced a stroke on health outcome measures (e.g., lipid profile,
exercise, dietary fat intake, health behavior). Thirty-five stroke survivors (9 male, 26 female) \((M = 53.2, SD = 8.3)\) were included, and reported their most common barriers to PA participation as cost of program, lack of transportation, lack of energy, and lack of knowledge about location of exercise. The HPP consisted of fitness instruction and exercise, nutrition education, and health behavior changes and was delivered three days per week (including 45-70 minutes of PA, 60 minutes of nutrition education, and 60-90 minutes of health behavior education) for 12 weeks. Total cholesterol and fat mass decreased while strength, flexibility, and endurance increased. Results emphasized the benefits of a HPP on physical functioning, which impacts secondary and chronic conditions.

In another study, Rimmer et al. (2002) examined the effects of a 12-week health promotion intervention on health measures (e.g., exercise, health behaviors, nutrition) of 30 African American women \((M age = 54.9, SD = 12.6)\). Common barriers to PA participation were also identified (e.g., fatigue, lack of support, lack of transportation). Educational sessions regarding diet, nutrition and health behavior were provided at no cost to participants and researchers offered free transportation. The participants who completed the intervention (72.5%) demonstrated considerable improvements in health measures (e.g., cardiovascular fitness, muscular strength and endurance, knowledge of nutrition). Results emphasize the effect that the removal of barriers and basic health education can have on PA and health behaviors.

In conclusion, HPPs that include PA interventions are beneficial for individuals with disabilities as they facilitate behavior change, resulting in increased functional ability and lower health care costs (Ravesloot et al., 2007). Regular PA participation has a positive impact on long-term health outcomes (Stuifbergen et al., 2003) by increasing various components of physical health and functional ability (Rimmer et al., 2000) and decreasing the chance of developing
secondary and chronic conditions. Among individuals who are already contemplating a PA program or who are already active, a PA education program can increase participation significantly by providing additional information (Stewart et al., 2001) or focusing on removal of barriers (Rimmer et al., 2002).

Despite the variety of benefits that accompany participation in a PA education based HPP, there is not one in place for individuals with a brain injury. Therefore, the purpose of the present study is to create and implement a PACE program for incorporation within a comprehensive outpatient program and describe the impact of PACE on individual participants. The PACE program aims to (1) increase PA self-efficacy, (2) increase intention to change PA behaviors, (3) increase amount of PA completed regularly, and (4) promote positive rehabilitation outcomes. Based on previous research it is hypothesized that participation in PACE will result in (1) increased PA self-efficacy, (2) forward progression in intention to change PA behaviors, (3) increased amount of PA completed, and (4) improved rehabilitation outcomes (i.e., abilities, adjustment, participation).
METHODOLOGY

Participants

Participants were recruited from a southwestern medical center’s comprehensive outpatient program for individuals with a brain injury, which is a part of the continuum of care for individuals with brain injury following inpatient rehabilitation. People enrolled in the outpatient program were living at home after completing inpatient rehabilitation, but attended the program between 9am-3pm, five days a week (M stay = 8 weeks). The rehabilitation program involves physical, occupational, and speech therapy, therapeutic recreation, neuropsychology, and social work as part of a comprehensive approach to return the patient to a standard of living that meets his/her outcome goals (e.g. independent living, return to work/school, participation in community activities).

Participants were chosen from the outpatient program for several reasons. First, although the patients received physical therapy and some PA, they did not receive any education about the importance of PA as part of the rehabilitation process. Second, the outpatient program is a critical last step for patients before they fully transition back into independent living at home and in the community. Patients are faced with the unique opportunity of completing a daily routine living at home while simultaneously attending a rehabilitation program that helps them transition to life post-discharge (e.g., discuss barriers and frustrations, create solutions with the support and help of medical professionals and other patients). Third, the outpatient program was considered an appropriate environment to introduce the PACE program as patients were already participating in daily rehabilitation sessions (e.g. learning about adjustment into life with a brain injury, chronic conditions associated with brain injury). These sessions frequently included a structured curriculum with handouts, group discussions, and application activities. Finally,
patients usually function at a higher cognitive level upon entrance into the comprehensive outpatient program than during their inpatient stay, increasing the likelihood that participants can engage cognitively (e.g., attention, retention) in the educational sessions. As a result of these factors, the comprehensive outpatient program was considered an appropriate environment for the implementation of the PACE program.

Purposive sampling was utilized with multiple inclusion and exclusion criteria. Inclusion criteria included (1) female or male, (2) ages 18 to 63, (3) first-time brain injury, (4) undergoing comprehensive outpatient rehabilitation, and (5) high cognitive functioning (determined by clinical cognitive assessment by a Neuropsychologist). Exclusion criteria included (1) aged younger than 18 years or older than 63 years, (2) severe cognitive impairment (determined by clinical cognitive assessment by Neuropsychologist), (3) pre-morbid mental illness and/or pre-morbid developmental disability. Cognitive functioning was determined by a Neuropsychologist who evaluated each patient using the Apathy Evaluation Scale: Clinician Version (Glenn, 2005), Awareness Questionnaire: Patient/Clinician forms (Sherer, 2004), Hopkins Verbal Learning Test – Revised (Brandt, 1991), and Trail Making Test Part B (Reitan, 1971). Patients deemed ‘high functioning’ were eligible for inclusion in the present study.

Procedure

Prior to enrolling any patients in the study the Institutional Review Board at the medical center and academic institute granted human subjects approval, guaranteeing all procedures were approved ethically. The present study included a study and comparison group, which was composed of retrospective data (see page 20 for more detail). Patients who met the inclusion/exclusion criteria were asked to participate in the PACE program immediately upon
enrollment in the comprehensive outpatient program and were familiarized with the purpose and requirements of the study (see Appendix B). Individuals were assured that all information collected would remain private and non-identifiable. Immediately following the consent process, participants completed the pre-test assessment with a research assistant who was not involved in PACE delivery. Participants then completed the normal comprehensive outpatient rehabilitation program in addition to PACE. PACE consisted of 16 one-hour sessions twice per week (Monday and Friday) that were completed in a small group setting (three to six people). The director of the outpatient program scheduled participant enrollment in the PACE program.

Post-test assessments were conducted upon discharge from the outpatient program during a scheduled 15-minute time. A research assistant not involved with the delivery of the program completed assessments. Once participants completed the questionnaires they were discharged from PACE with their workbook, which also included detailed information about program topics.

A clinical issue with the procedure existed as a result of the patients’ variable length of stay in the program. For example, the average length of stay in the outpatient program was 8.5 weeks; however, some patients were discharged at different times for a variety of issues (e.g., insurance coverage, speed of recovery, adherence). As a result, some participants completed nearly the full eight-week PACE program while some completed only two weeks. This provided a challenge for program continuity as some individuals enrolled in PACE at the beginning whilst others would join later. For example, it was possible that some patients enrolled in PACE for shorter durations and were not exposed to the program long enough to effectively initiate behavior change. However, this is an issue faced by all programs within comprehensive rehabilitation due to the ongoing nature of brain injury, and examining the PACE program with
this limitation provides a more realistic picture of how it would function in the typical clinical setting. However, the enrollment issue emphasized the need for all sessions within the PACE program to (1) inter-connect with other PACE topics in a nonlinear fashion so participants could enroll at anytime, and (2) review key information from previous topics during every session.

The present research included both a study group and comparison group. The design of the comparison group was based upon the model of a proportionate mortality or morbidity study within epidemiology (Stone, Armstrong, Macrina, & 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 or medical test) in a reference population (e.g., previous discharged patients may serve as retrospective data). This increases the likelihood that the measures are proportionate (equal). This method of comparison was used within the present study because of limitations in sample size (e.g., control and experimental group) and the clinical issue of providing only some patients with a potentially beneficial PACE program. 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 experimental group with the exception of the PACE program.

Patients enrolled in the comprehensive outpatient program completed the Mayo Portland Adaptability Inventory – 4 (MPAI-4) (Malec, 2005) as a measure of rehabilitation outcomes (i.e., abilities, adjustment, participation). Thus, data for the comparison group was collected from
retrospective MPAI-4 questionnaires completed by patients enrolled in 2008. The data collected from the MPAI-4 for the study and comparison groups served as the main dependent variable for the present study as the MPAI-4 is recognized as the major measure of rehabilitation outcomes post brain injury (Malec & Thompson, 1994; Malec, 2001). Variables related to PA behavior (e.g., PA self-efficacy, amount and intensity of PA participation) were only examined within the study (PACE) group, as retrospective data was not available for these measures.

**PACE Development**

The PACE program incorporated five behavioral strategies to facilitate the adoption and maintenance of PA behaviors which included (1) goal setting and tracking progress towards goals; (2) creating social support for newly established PA behaviors; (3) employing self-reward to reinforce positive PA behaviors; (4) using problem solving strategies to overcome individual barriers and increase the likelihood of PA maintenance; and (5) maintenance of PA behaviors and prevention of relapse to a sedentary lifestyle. These specific strategies were identified by comparing the components of successful PA education interventions (Gillis et al., 2003; Ravesloot et al., 2007; Stuifbergen et al., 2003) with the guidelines provided by the USDHHS/CDC (Kahn et al., 2002; USDHHS, 1999) for creating HPPs. The strategies were also influenced by the methods outlined in the SCT for increasing self-efficacy (Bandura, 1986) and the Transtheoretical Model for increasing intention to change behavior (Prochaska & DiClemente, 1983).

The PACE curriculum was developed with the aid of the director of the outpatient program and a physical therapist working with patients with brain injury. The program was intended to conform to a standardized mode of delivery, including a review of the key
educational components within each session. This was necessary as individuals with brain injuries often experience disruption of cognitive activities (i.e., recall, memory, and reasoning), difficulty with sensory processing (i.e., sight and hearing), and inefficiency in communication (i.e., understanding presented information and expressing thoughts) (National Institute of Neurological Disorders and Stroke, 2002). To aid in the comprehension and retention of information, PACE curriculum reviewed foundational points every session and employed multiple modes of delivery. These modes included short information sessions, group discussions (i.e., questions posed based on topics covered to facilitate group application), visual aids (e.g., interactive worksheets, diagrams, etc.), educational games (e.g., matching or fill-in-the-blank activities, etc.), printed materials (e.g., outlines for each lecture, in-depth information available for each topic, goal-setting and behavior tracking worksheets, etc.) (see Appendix A for details). Each participant received a workbook with all the session materials included (e.g., worksheets intended for participant use during each session, detailed teaching notes for each session included as a resource at the end of the workbook) which served as an educational resource throughout participation in the PACE program, as well as a long-term reference tool upon discharge.

A portion of the PACE materials were piloted so that the researchers became comfortable with the delivery of the materials and the participant group, who were also asked for feedback so that improvements could be made. Five pilot sessions (each with 4-8 participants in attendance) were delivered in a nonlinear fashion (e.g., implement session 4 before session 2) so that the researchers became more comfortable integrating topics as smoothly as possible. The pilot version of the PACE program helped to identify how much information was feasible to include in each hour-long session and how much information participants retained from one session to
the next (determining the frequency and detail necessary for the successful review of key points). Participants reported that group discussions were easy to follow and were the preferred form of information delivery. Many participants were also pleased with their ability to understand more complex concepts relating to PA due to the simple format in which they were delivered. All participants reported that PACE sessions helped them understand the importance of PA and the relevance of PA to their rehabilitation. Throughout pre-testing, instructors learned techniques that facilitated more active group discussions. For example, presenting information in the form of case studies and asking questions pertaining to the fictional characters in the studies helped to engage participants. Additionally, having a second instructor participate by offering an answer to a question that the main instructor asked helped participants feel more confident in joining a discussion rather than beginning one. Both PACE instructors were graduate students studying kinesiology with a concentration in special populations and had completed comprehensive reviews of literature regarding PA and brain injury and implementing HPPs for individuals with disabilities.

**Measures**

Initial demographic data was 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) (see Appendix D for details).
Both the pre-test and post-test assessments examined rehabilitation outcomes (e.g. abilities, participation, adjustment) and PA behavior variables (i.e., PA self-efficacy, PA stage of change, and amount of PA completed). Each variable was selected due to its role as a measure of rehabilitation outcomes or PA behaviors.

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, 2005). The inventory is composed of three subscales including (1) abilities, (2) adjustment, and (3) 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 9 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 9 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 calculated, 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, 2005).

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 6 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). Scores from each item are added and the total score is used. 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., pre-contemplation, 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. Pre-contemplation 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 six 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 six 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 two-week period (Marcus et al., 1992) and has been used with adults with brain injury (Driver, Ede, Dodd, Stevens & Warren, 2010).

Type and amount of PA completed during a typical week was estimated with the exercise items from the behavioral risk factor surveillance system survey (BRFSS) (USDHHS, 2001). Participants are asked to indicate the frequency of any moderate physical activity (e.g., small increases in heart rate – brisk walking, bicycling, vacuuming, gardening), and/or vigorous physical activity (large increases in breathing or heart rate – running, aerobics, heavy yard work) in the past week by choosing one of five answer choices (“No, away from work I do not do moderate or 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”; “Yes, at work I do vigorous 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 moderate level activities for at least 10 minutes at a time”). This scale has been used with adults with a traumatic brain injury (TBI) undergoing comprehensive outpatient (Driver, Ede, Dodd, Stevens & Warren, 2010) and long-term outpatient rehabilitation (Driver, 2009).
Data Analysis

The data analysis consisted of three steps, including (1) descriptive analyses, (2) effect size (Cohen, 1988) to determine the strength of the relationship between the pre- and post-tests of the participants’ rehabilitation outcomes (i.e., abilities, adjustment, participation), exercise self-efficacy, stages of change, and type and amount of PA completed weekly, and (3) percent change between the pre- and post-tests of each variable. The statistical analysis was produced using 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 pre-test and post-test (Cohen, 1988). An ES = .50 is considered moderate, and an ES of .80 or greater is a large ES (Cohen, 1988).
RESULTS

Means and standard deviations for demographic data collected during pre-testing can be found in Table 4. Ten patients in the comprehensive rehabilitation program were eligible for participation, one of which declined to consent. Participants who completed the PACE program ($N = 9$; male = 4; female = 5) were an average of 55.7 years old ($SD = 9.7$ years; min = 35 years; max = 63 years), with the majority reporting their race to be Caucasian (77.8%) with a second racial group of African American (22.2%) (see Table 5 for more information on participants).

Rehabilitation outcomes (i.e., abilities, adjustment, participation) were measured with the MPAI-4 and total scores for PACE participants decreased an average of 10.11 points from 45.78 (moderate limitation) to 35.67 (mild limitation), as compared to patients in 2008 who demonstrated an average decrease of 8.84 points from 42.98 (moderate limitation) to 34.13 (mild limitation). PACE participants demonstrated comparable decreases in scores to patients in 2008 from pre-testing to post-testing for every subscale of the MPAI-4 questionnaire (PACE abilities = 9.66 versus 2008 abilities = 8.47; PACE adjustment = 8.11 versus 2008 adjustment = 6.58; PACE participation = 10.0 versus 2008 participation = 9.96) (see Table 6).

Participants’ exercise self-efficacy increased an average of 16.1% from pre-testing to post-testing (effect size [ES] = 0.41). The greatest increase in self-efficacy occurred for the item of weather (43.36% increase), followed by excuse making (30.08% increase), inconvenience (21.54% increase), resistance from others (11% increase), negative affect (10.56% increase), and exercising alone (6.27% decrease) (see Table 7). Furthermore, four out of nine participants progressed forward through the stages of change (i.e. pre-contemplation; contemplation; preparation; action; and maintenance) from pre-test to post-test. Two participants moved forward one stage of change and two moved forward two stages (see Table 8). Before the PACE
program, three participants reported being in the action stage while none reported being in maintenance. By the end of the PACE program, five reported being in action and one reported being in maintenance. 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 (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

Overall, the purpose of the project was to create and implement a PACE program for individuals with a recent brain injury and report the results on participants’ rehabilitation outcomes, self-efficacy, and intention to change PA behaviors. In respect to this purpose, 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.

While the existing rehabilitation program does not currently include a PA education component, patients have access to services such as physical therapy, occupational therapy, and social work that teach skills to increase their functional independence (Altman, Swick, Parrot, & Malec, 2010). In response to these services, 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 demonstrates this improvement in rehabilitation outcomes (see Table 6). PACE participants demonstrated a comparable difference between pre-test and post-test scores to patients enrolled in 2008, suggesting that PACE is also effective in producing favorable rehabilitation outcomes at discharge. The participation subscale (e.g., initiation, leisure and recreation activities, transportation, etc.) demonstrated the largest difference between pre- and post-tests in the PACE group (\(M\) difference = 10.00). High levels of participation are extremely desirable for patients post-brain 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). Based on the initial findings, 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. These findings support previous research, which demonstrate that regular PA can increase quality of life (e.g. physical functioning), physical ability, and long-term health outcomes in individuals with disabilities (Ravesloot, Seekins, & Cahill, 2007; Rimmer et al., 2000; Stuifbergen, Becker, Blozis, Timmerman, & Kullberg, 2003). Based on current findings and past research, PA education programs such as PACE should be implemented into clinical rehabilitation settings in order to maximize rehabilitation outcomes.

Participation in PA has been shown to increase as one’s self-efficacy increases (Haworth, Young, & Thornton, 2009; Reuter et al., 2010). Exercise self-efficacy increased in PACE participants (ES = .41), signifying they had greater belief in their ability to engage in PA in the face of barriers after the PACE program than they did pre program (see Table 7). Self-efficacy is a crucial element to behavior change, specifically the adoption and maintenance of PA behaviors (Haworth et al., 2009; Nahas, Goldfine, & Collins, 2003; Reuter et al., 2010), and this increased self-efficacy improves the likelihood that participants will be successful at problem-solving to overcome barriers and engage in regular PA (Bandura, 1986; Haworth et al., 2009; Reuter et al., 2010) once they are discharged from comprehensive outpatient rehabilitation. This is significant, as previous research has shown that individuals with brain injuries face a high number of barriers to PA when living in the community (Driver, Ede, Warren, & Stevens, 2009; Driver, 2005). Thus, results support previous research demonstrating that HPPs that include PA education can result in increased self-efficacy (Stuifbergen et al., 2003). Increasing PA self-efficacy in a clinical setting can help prepare patients to overcome the barriers they will face once they transition back to living in the community.
Patients’ participation in PA while living in the community is also influenced by their readiness to be physically active. For example, patients in the pre-contemplation stage would be unlikely to complete PA independently, whereas patients in the action or maintenance stage would most likely be successful in regular PA participation (Prochaska & DiClemente, 1983). While only 3 out of 9 participants reported being in either the action or maintenance stage during pre-testing, 6 out of 9 participants reported action or maintenance at post-testing (see Table 8). Four participants remained in the same stage at both pre- and post-testing, however three of these participants were already in the action stage (e.g., Male 4, Female 4, Female 5) (see Tables 3 and 6). While moving through the stages of change is an individualized, dynamic process and often takes time (USDHHS, 1999), these results demonstrated that PACE was generally successful in beginning the process of moving participants towards action. This progression indicated that participants’ perceived frequency and consistency of PA did increase during the PACE program. Regular participation in PA can decrease the amount of secondary or chronic conditions that individuals may experience after brain injury, resulting in better long-term rehabilitation outcomes, greater independence, and better quality of life (Goodwin & Compton, 2004; Jankowski & Sullivan, 1990; Lollar & Crews, 2003; Rimmer & Rowland, 2008). Clinically, participation in the PACE program can strengthen an individual’s intention to be involved in PA, leading to increased adherence to regular PA and more favorable long-term rehabilitation and health outcomes.

At present, the PACE program is the only intervention at the outpatient rehabilitation facility designed to engage participants in a “coaching” style rather than an “instructive” manner. After staff at the outpatient rehabilitation program observed the unique teaching style of the PACE curriculum, the director of the program asked to film PACE sessions in order to use the
teaching style approach as a model for other therapists working in the outpatient program. Anecdotal observations of PACE instructors and staff at the rehabilitation facility reported that the case studies, group discussions, games, and interactive worksheets within the PACE curriculum successfully held participants’ attention and drew the entire group into conversation about PA each session. Participants who often did not talk or open up in other therapy sessions became interested and involved in PACE, displaying the true interactive nature of the PACE curriculum. Instructors noted that participants who moved through PACE together became sources of social support for one another, regularly encouraging others in the group to increase their levels of PA. This social support is significant, as social persuasion is one method in which self-efficacy can be increased (Bandura, 1986). Furthermore, social support has also been identified as a component that increases the effectiveness of PA education interventions (Gillis et al., 2003; Ravesloot et al., 2007; Stuifbergen et al., 2003). Discussion will now focus on suggestions to increase the reach of the PACE program beyond the clinical setting.

Future Research

Efforts from the present study can serve as a platform for future research intended to further test the effectiveness of the PACE program and increase the impact of PACE beyond participants’ involvement during rehabilitation. For example, the PACE program should continue to run within the outpatient rehabilitation program in order to include more participants and increase the sample size to allow for the statistical significance of the program to be determined. Furthermore, PACE participants should receive follow-up contact (e.g., at 3, 6, 9, and 12 months) after discharge from the program in order to detect the maintenance of change over time. At the follow-up times participants would complete the same measures included in the
present study. In addition, a control group should be added whereby participants who do not
participate in the PACE program complete the same measures (i.e. Exercise Self-Efficacy Scale;
Exercise Stage of Change Scale; Amount and Intensity of PA; Rehabilitation outcomes) before
and after their involvement in the outpatient rehabilitation program. These results can then be
compared with the results of the participants who were involved in the PACE program to detect
any differences that can be attributed to the PACE program.

It is suggested that the length of the PACE curriculum and the frequency of delivery be
amended for future use. The mean length of stay for PACE participants was 5.5 weeks, in which
time they were unable to experience the entire PACE 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.

Additionally, a follow-up program that begins after participants are discharged from
rehabilitation should be created. This program could potentially be based online, and could
include 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.
Through these features, participants could also ask questions of instructors. Further online
features could include information about various community programs and events, information
on using equipment properly at the gym or at home, and continuing education comprised of new
PA research as it is released. 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 to act as tutors and
facilitators throughout the rehabilitation journey. However, despite the PACE programs apparent success, several limitations were present during the study.

Limitations

The study had a number of limitations that were related to clinical issues due to operating within the outpatient rehabilitation program. First, over a time period of six months only nine participants were eligible for participation within the study. This small sample size limited the ability to utilize more sophisticated data analysis techniques (e.g., multivariate analysis of covariance). In addition, 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 reviewing valuable information, even though PACE curriculum was designed to prepare for this event. Variable enrollment length was another clinical issue, meaning that participants would 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, severity of impairments, etc. PACE participants attended an average of 11 out of 16 sessions (5.5 weeks; \(\text{min} = 5\) sessions or 2.5 weeks; \(\text{max} = 15\) sessions or 7.5 weeks). The number of sessions attended was also influenced by time absent for reasons such as illness, doctor appointments, etc. A fourth limitation was the incorrect scoring of the Amount and Intensity of PA measure. During both the pre- and post-tests, 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 error (Ravesloot et al., 2005; USDHHS, 2001), the pilot work for the current study should have tested all measures prior to use. 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 final limitation was the decrease in the self-efficacy subscale of exercising alone. The self-efficacy questionnaire asked participants how confident they were to exercise if they had to do it alone. However, many participants had instructions from a physician to exercise under supervision while in rehabilitation, so participants responding that they were not comfortable may have done so because of physician limitations and not personal self-efficacy.
CONCLUSION

Brain injury is a serious public health issue in the United States that causes a myriad of chronic and secondary conditions. Regular PA is strongly related to positive rehabilitation outcomes for individuals with a brain injury, yet most rehabilitation programs do not include PA education interventions. The current study demonstrated the effectiveness of the PACE PA education curriculum in producing comparable rehabilitation outcomes to an outpatient rehabilitation program, and increasing the exercise self-efficacy and intention to change PA behaviors in participants with a brain injury. With further research and evidence to support the efficacy of PACE, it can be demonstrated that PA education is a key component missing from most brain injury rehabilitation programs. Implementing a PA HPP like PACE can help such programs produce more favorable rehabilitation outcomes.
### Table 2

**Interaction of PACE Components with Behavioral Theories**

<table>
<thead>
<tr>
<th>COMPONENT OF PACE</th>
<th>TRANSTHEORETICAL MODEL</th>
<th>SOCIAL COGNITIVE THEORY</th>
<th>PACE SESSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition and importance of PA</strong></td>
<td>Belief in importance of desired behavior essential in moving from “pre-contemplation” through stages to “action”</td>
<td></td>
<td>Detailed in sessions 1-4 (reviewed in every session)</td>
</tr>
<tr>
<td><strong>Impact on PA on health outcomes</strong></td>
<td>Belief in importance of desired behavior essential in moving from “pre-contemplation” through stages to “action”</td>
<td></td>
<td>Detailed in sessions 3, 4, 12, 14, &amp; 16 (reviewed in sessions 5-16)</td>
</tr>
<tr>
<td><strong>Impact of PA on conditions associated with brain injury</strong></td>
<td>Belief in importance of desired behavior essential in moving from “pre-contemplation” through stages to “action”</td>
<td></td>
<td>Detailed in sessions 4 &amp; 14 (reviewed in sessions 4-16)</td>
</tr>
<tr>
<td><strong>Goal-setting and evaluation of goals</strong></td>
<td>Gives practical and realistic steps to incorporate PA into lifestyle, moving from “contemplation” or “preparation” to “action”</td>
<td>Draws self-efficacy from past performance and physiological state</td>
<td>Detailed in sessions 5-16</td>
</tr>
<tr>
<td><strong>Identifying potential barriers &amp; creating strategies to overcome them</strong></td>
<td>Equips individuals to prevent reverting to an earlier SOC</td>
<td>Draws self-efficacy from past performance</td>
<td>Detailed in sessions 6, 10, 11, &amp; 11 (reviewed in sessions 7-16)</td>
</tr>
<tr>
<td><strong>Role of self-efficacy in behavior change; how to increase self-efficacy</strong></td>
<td>Teaches individuals to increase self-efficacy, which increases likelihood of moving forward through SOC</td>
<td>Teaches individuals multiple ways to increase self-efficacy</td>
<td>Detailed in sessions 5-16</td>
</tr>
<tr>
<td><strong>Becoming aware of the environment</strong></td>
<td>Teaches individuals to anticipate potential barriers that may result in reverting to an earlier SOC and create potential solutions</td>
<td></td>
<td>Detailed in sessions 6, 10, 11, 14</td>
</tr>
<tr>
<td><strong>Looking to others to gather experience and support</strong></td>
<td></td>
<td>Increases self-efficacy through social persuasion and vicarious experiences</td>
<td>Detailed in session 9 (reviewed sessions 10-16)</td>
</tr>
<tr>
<td><strong>Instruction on how to progress to the next SOC</strong></td>
<td>Gives practical and realistic steps for moving forward through SOC</td>
<td></td>
<td>Detailed in sessions 7 &amp; 15 (reviewed in sessions 8-16)</td>
</tr>
<tr>
<td><strong>Self-reinforcement to make behavior change more likely and permanent and keep motivation high (i.e., rewards, social participation)</strong></td>
<td>Increases individuals’ motivation to move forward through SOC and prevent reverting to an earlier SOC</td>
<td>Increases self-efficacy through past performance, vicarious experiences, social persuasion, and physiological state</td>
<td>Detailed in session 8 (reviewed in sessions 9-16)</td>
</tr>
<tr>
<td><strong>How to maintain a habit of regular PA</strong></td>
<td>Practical tips to move from “action” to “maintenance”</td>
<td>Practical tips to continue to increase self-efficacy</td>
<td>Sessions 15 &amp; 16</td>
</tr>
</tbody>
</table>
### Summary of PACE Content

<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to PA</td>
</tr>
<tr>
<td>2</td>
<td>Exercise is Medicine</td>
</tr>
<tr>
<td>3</td>
<td>Goal-Setting and Overcoming Barriers</td>
</tr>
<tr>
<td>4</td>
<td>Tracking Behavior and Self-Reward</td>
</tr>
<tr>
<td>5</td>
<td>Managing Frustration and Discouragement</td>
</tr>
<tr>
<td>6</td>
<td>PA, Quality of Life, and Community Involvement</td>
</tr>
<tr>
<td>7</td>
<td>Reevaluating Goals</td>
</tr>
<tr>
<td>8</td>
<td>How to Maintain Health Habits</td>
</tr>
</tbody>
</table>
Table 4

Participant Demographics

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Group</th>
<th>Mean</th>
<th>Min</th>
<th>Max</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>N=9</td>
<td>55.7 years</td>
<td>35</td>
<td>63</td>
<td>9.7</td>
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<tr>
<td>Days with Moderate Intensity PA</td>
<td>Pre-Injury</td>
<td>3.1</td>
<td>0</td>
<td>7</td>
<td>2.4</td>
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<tr>
<td></td>
<td>Post-Injury</td>
<td>1.4</td>
<td>0</td>
<td>5</td>
<td>1.8</td>
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</table>

Frequency

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>5</td>
</tr>
</tbody>
</table>

| Marital Status | Divorced | 3 |
|                | Married  | 4 |
|                | Single   | 2 |

| Number of Children | 0 | 1 |
|                    | 1 | 2 |
|                    | 2 | 3 |
|                    | 3 | 3 |

| Ethnicity      | Black | 2 |
|               | Caucasian | 7 |

| Education      | High school | 1 |
|                | 2 yr degree | 1 |
|                | Some College | 5 |
|                | Bachelor’s | 1 |
|                | Master’s | 1 |

| Area Lived     | Urban | 1 |
|                | Suburban | 7 |
|                | Rural  | 1 |

| Role in Industry | Upper mgmt | 3 |
|                 | Junior mgmt | 1 |
|                 | Admin staff | 1 |
|                 | Support staff | 1 |
|                 | Professional | 1 |
|                 | Skilled labor | 1 |
|                 | Other | 1 |

| Income         | $20-29K | 1 |
|               | $30-39K | 1 |
|               | $50-74K | 5 |
|               | $75-99K | 0 |
|               | $100-150K | 1 |
|               | Rather not say | 1 |
Table 5

Participant Characteristics

<table>
<thead>
<tr>
<th>Part.</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>
<th># of Sessions</th>
<th>Sessions Attended (in order)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male 1</td>
<td>3/11/47</td>
<td>12/19/10</td>
<td>Stroke</td>
<td>7</td>
<td>2</td>
<td>0</td>
<td>Fair</td>
<td>15</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15</td>
</tr>
<tr>
<td>Female 1</td>
<td>8/24/47</td>
<td>12/1/10</td>
<td>Stroke</td>
<td>4</td>
<td>2</td>
<td>Don’t know</td>
<td>Good</td>
<td>14</td>
<td>3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 1, 2</td>
</tr>
<tr>
<td>Male 2</td>
<td>7/8/75</td>
<td>2/20/11</td>
<td>Stroke caused by surgery</td>
<td>0</td>
<td>0</td>
<td>Don’t know</td>
<td>Fair</td>
<td>14</td>
<td>3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 16, 1, 2</td>
</tr>
<tr>
<td>Male 3</td>
<td>3/15/52</td>
<td>2/16/11</td>
<td>Stroke caused by surgery</td>
<td>1-2</td>
<td>0</td>
<td>21</td>
<td>Fair</td>
<td>12</td>
<td>2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16</td>
</tr>
<tr>
<td>Female 2</td>
<td>7/1/56</td>
<td>1/3/11</td>
<td>Stroke</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>Good</td>
<td>11</td>
<td>9, 11, 12, 14, 15, 1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>Male 4</td>
<td>10/31/50</td>
<td>12/17/10</td>
<td>Stroke</td>
<td>0</td>
<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 3</td>
<td>12/5/65</td>
<td>2/13/11</td>
<td>Motorcycle accident (TBI)</td>
<td>4-5</td>
<td>0</td>
<td>0</td>
<td>Good</td>
<td>10</td>
<td>15, 16, 1, 2, 3, 4, 5, 6, 7, 9</td>
</tr>
<tr>
<td>Female 4</td>
<td>10/23/46</td>
<td>1/17/11</td>
<td>Stroke</td>
<td>5</td>
<td>Don’t know</td>
<td>0</td>
<td>Good</td>
<td>5</td>
<td>14, 15, 16, 1, 2</td>
</tr>
<tr>
<td>Female 5</td>
<td>10/28/52</td>
<td>12/18/10</td>
<td>Stroke</td>
<td>2</td>
<td>1-2</td>
<td>0</td>
<td>Fair</td>
<td>5</td>
<td>9, 10, 11, 12, 13</td>
</tr>
</tbody>
</table>

* Number of days per week participant engaged in moderate-intensity PA pre-injury  
^ Number of days per week participant engaged in moderate-intensity PA post-injury  
+ 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 6

**MPAI-4 Results**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>PACE pre mean</th>
<th>Standard Deviation</th>
<th>PACE post mean</th>
<th>Difference</th>
<th>Effect size</th>
<th>2008 pre mean</th>
<th>2008 post mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abilities</td>
<td>51.22</td>
<td>7.45</td>
<td>41.56</td>
<td>-9.66</td>
<td>1.30</td>
<td>41.93</td>
<td>33.47</td>
</tr>
<tr>
<td>Adjustment</td>
<td>42.00</td>
<td>4.66</td>
<td>33.89</td>
<td>-8.11</td>
<td>1.74</td>
<td>37.51</td>
<td>30.98</td>
</tr>
<tr>
<td>Participation</td>
<td>47.89</td>
<td>3.41</td>
<td>37.89</td>
<td>-10.00</td>
<td>2.93</td>
<td>40.84</td>
<td>30.89</td>
</tr>
<tr>
<td>Total</td>
<td>45.78</td>
<td>6.06</td>
<td>35.67</td>
<td>-10.11</td>
<td>1.67</td>
<td>42.98</td>
<td>34.13</td>
</tr>
</tbody>
</table>

### Table 7

**Exercise Self-Efficacy Results**

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre mean</th>
<th>Post mean</th>
<th>Effect size</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative Affect</td>
<td>3.22</td>
<td>3.56</td>
<td>0.20</td>
<td>10.56</td>
</tr>
<tr>
<td>Excuse Making</td>
<td>2.56</td>
<td>3.33</td>
<td>0.58</td>
<td>30.08</td>
</tr>
<tr>
<td>Exercising Alone</td>
<td>3.67</td>
<td>3.44</td>
<td>0.17</td>
<td>-6.27</td>
</tr>
<tr>
<td>Inconvenient</td>
<td>3.11</td>
<td>3.78</td>
<td>0.46</td>
<td>21.54</td>
</tr>
<tr>
<td>Resistance from others</td>
<td>3.00</td>
<td>3.33</td>
<td>0.22</td>
<td>11.00</td>
</tr>
<tr>
<td>Weather</td>
<td>2.56</td>
<td>3.67</td>
<td>0.70</td>
<td>43.36</td>
</tr>
<tr>
<td>Total</td>
<td>18.11</td>
<td>21.11</td>
<td>0.41</td>
<td>16.1</td>
</tr>
</tbody>
</table>
Table 8

*Exercise Stage of Change Results*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Precontemplation</th>
<th>Contemplation</th>
<th>Preparation</th>
<th>Action</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male 1</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male 2</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male 3</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
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<tr>
<td>Post-test</td>
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<tr>
<td>Male 4</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female 1</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pre-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Post-test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female 2</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pre-test</td>
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<td></td>
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<tr>
<td>Post-test</td>
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<td></td>
</tr>
<tr>
<td>Female 3</td>
<td></td>
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<td>X</td>
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<tr>
<td>Pre-test</td>
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<tr>
<td>Post-test</td>
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<tr>
<td>Female 4</td>
<td></td>
<td></td>
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<td>X</td>
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<tr>
<td>Pre-test</td>
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<tr>
<td>Post-test</td>
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</tr>
<tr>
<td>Female 5</td>
<td></td>
<td></td>
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<tr>
<td>Pre-test</td>
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<tr>
<td>Post-test</td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>
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>
<th>Target HR Zone</th>
<th>Average Maximum Heart Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>50–85%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>100–170 bpm</td>
<td>200 bpm</td>
</tr>
<tr>
<td>25 years</td>
<td>98–166 bpm</td>
<td>195 bpm</td>
</tr>
<tr>
<td>30 years</td>
<td>95–162 bpm</td>
<td>190 bpm</td>
</tr>
<tr>
<td>35 years</td>
<td>93–157 bpm</td>
<td>185 bpm</td>
</tr>
<tr>
<td>40 years</td>
<td>90–153 bpm</td>
<td>180 bpm</td>
</tr>
<tr>
<td>45 years</td>
<td>88–149 bpm</td>
<td>175 bpm</td>
</tr>
<tr>
<td>50 years</td>
<td>85–145 bpm</td>
<td>170 bpm</td>
</tr>
<tr>
<td>55 years</td>
<td>83–140 bpm</td>
<td>165 bpm</td>
</tr>
<tr>
<td>60 years</td>
<td>80–136 bpm</td>
<td>160 bpm</td>
</tr>
<tr>
<td>65 years</td>
<td>78–132 bpm</td>
<td>155 bpm</td>
</tr>
<tr>
<td>70 years</td>
<td>75–128 bpm</td>
<td>150 bpm</td>
</tr>
</tbody>
</table>

- **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.
  o 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
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?
- 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”
- 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?
- The role of inactivity in American Life
  - 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
  - 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 (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?

- I can easily hurt myself participating in PA, so it’s not worth it.
- I have to work out really hard to see any benefits, and I am not able to do that.
- People only need to exercise if they have a weight problem.
- Exercise isn’t fun, it’s hard work.
- I’m too old to learn how to exercise
- 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
  - Minor injury to bones, muscles, tendons, and joints can sometimes occur
- Safe exercise practices help to prevent injury
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.

People only need to exercise if they have a weight problem.

Exercise isn’t fun, it’s hard work.

I’m too old to learn how to learn how to exercise.

If I can’t be active for the amount of time recommended (150 minutes per week), 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.

Session 3 - Exercise is medicine - General
Population

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”
  - How does exercise affect MY 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?

Exercise is Medicine
- The Greeks had it right 2000 years ago
  - 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</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

http://www.youtube.com/watch?v=GYBLR7DhjVY&feature=related
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
  - Sometimes medication is necessary, BUT
  - 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?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular Disease (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>
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<td>Hypertension</td>
<td>More exercise equals lower blood pressure</td>
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<td>Reduces chance of developing more severe symptoms. Both aerobic and resistance exercises associated with decreased risk of diabetes</td>
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<tr>
<td>Coronary Heart Disease</td>
<td>Exercise may reduce issues of plaque in blood vessels</td>
</tr>
<tr>
<td>High Cholesterol</td>
<td>Endurance PA increases good cholesterol (HDL) and decreases bad cholesterol (LDL)</td>
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<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>

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
  - 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
  - What is a functional consequence?
  - What are examples of functional activities that YOU value?
- Decreased ability to return to work
- Decreased ability to do your job well
  - 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 levels</td>
<td>Improved (lowered)</td>
</tr>
<tr>
<td>Walking speed</td>
<td>Faster</td>
</tr>
<tr>
<td>Walking assistance</td>
<td>Decreased</td>
</tr>
<tr>
<td>Balance and coordination</td>
<td>Improved</td>
</tr>
</tbody>
</table>

Benefits of Specific Physical Fitness Areas on TBI/Stroke

<table>
<thead>
<tr>
<th>Type of Fitness</th>
<th>Physical Activity Suggestions</th>
<th>Goal(s)</th>
</tr>
</thead>
</table>
| Aerobic         | Cycling, Walking, Seated Stepper, Upper and Lower Body Ergometer | Increase walking speed
|                  |                              | Decrease risk of CV disease                                                                |
|                  |                              | Increase independence of moving                                                              |
|                  |                              | Increase ability to do enjoyable daily activities                                           |
| Strength         | Free Weights, Stationary Exercise, | Increase independence of                                                                    |

<table>
<thead>
<tr>
<th></th>
<th>Free Weights, Bands</th>
<th>completing daily activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flexibility</strong></td>
<td>Stretching</td>
<td>Increase range of motion in arms and legs, neck, and trunk that can be affected by TBI</td>
</tr>
<tr>
<td><strong>Coordination and Balance</strong></td>
<td>Assisted balance exercises (examples from PT)</td>
<td>Begin to regain balance to ease walking and increase safety in doing daily activities</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”
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?
  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?

How do I decide what goals are right for me?

• What is a goal?
  o 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?
  o 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:
  - 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.”
  - 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.”
  - 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.”
  - 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.”
  - 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

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

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?
  - 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?

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?
  - 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 participantbrainstorms 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:

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

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<th>Barrier</th>
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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)
  - 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 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**

John 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

80
• 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”
What “Stage of Behavior Change” am I in?

- **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?

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**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 Martin in?

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

---

**CASE STUDY #2**

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

- **How can rewards help me reach my goals?**
  o Are you motivated by rewards? If not, what motivates you?
  o Does your reward move you closer to your goal?
  o Ex. Buying new workout clothes or shoes
  o Does your reward move you further away from your goal?
  o 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!
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. Active friends can help you with transportation, new exercise ideas, and safety while exercising.

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
o 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”
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
(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.”

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?
o 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?

o What benefits do I get from achieving my goal?
  ▪ When you achieve your physical activity goals, how does that make you feel (physically) (emotionally)?

o 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?

o 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?

o Are my goals realistic?

o 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?
    o Who are these people in your life?
    o Will these people be around for years to come?
    o 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?
    o Would your support group be willing to join you in your physical activities?
    o If not, where can you meet friends who will?
    o 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?
    o Am I willing to spend time working on their goals?
    o Am I willing to be a role model? Do I believe I CAN be a role model?
    o 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 DETOURES

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
    - REVIEW COMMON BARRIERS
  - What’s the best way to deal with frustration?

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?
    - Barrier = an expected roadblock
      - Ex. Lack of transportation, money, etc.
    - Detour = an unexpected roadblock
      - Ex. Sudden illness, accident, loss of employment, etc.
  - 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:
  - 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?
    - 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?

SESSION 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?
  - 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

**What is quality of life?**

- Quality of life – general well-being

- **What are important parts of your quality of life?**
  - Low stress and depression
  - Spirituality
  - Time and energy for family and friends
  - Physical ability to participate in hobbies
  - Ability to take care of oneself
  - Mental health

- **What activities of daily living contribute most to your independence?**
  - Driving
  - Cooking
  - Personal hygiene
  - Cleaning
  - Hobbies

- **Your ability to do activities of daily living declines about 1% every year after the age of 30.**
  - 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 experience arthritis pain or general stiffness that keeps you from doing the things you love
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?*
  - 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”
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:
  o Help your heart maintain the ability to pump efficiently
  o Help keep blood pressure lower
  o Maintain strength and muscle mass
  o Increases bone mineral density – reduces risk of osteoporosis
  o Improve metabolism
  o Help control weight
  o Improve memory and reasoning
  o 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

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**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?
• Think back to the goals you’ve set in the past few weeks. Have they been successful?
  o *Why or why not?*
• What do you need to change about the goal to make it successful?
• What do you need to change about your behavior to make your goal successful?
• What’s the difference between a short-term and a long-term goal?

Small group sessions to set new short- and long-term goals
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 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?
  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

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.
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 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:
  o When, where, what, and how much activity you’re doing
  o Write barriers that you run into
  o Write how you overcome the barriers and how you plan to overcome them in the future
o Write any feelings of success or frustration
o Keep track of what motivates you to be active as these motivations change
o Continuously decide if your rewards are still working
o 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:
  o Were the goals realistic? Challenging or too easy?
  o Did you run into any barriers?
  o Were you able to find ways to overcome barriers?
  o Did you use rewards?
    o Do your rewards motivate you to work hard?
    o If not, what motivates you to be active? How can you choose a reward that increases this motivation?
  o Did you hold yourself accountable or ask someone else to help hold you accountable for your goals?
  o How do you need to modify your goal to make it more effective?
  o 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
    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)
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
    - REVIEW 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.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?
  ▪ http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html
• 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:
• Exercise and Hot Weather:
  o http://www.mayoclinic.com/print/exercise/HQ00316/METHOD=print
• When Money is a Barrier:
  o http://www.mayoclinic.com/print/fitness/HQ00694_D/METHOD=print
• Yoga for Brain Injury:
  o http://www.specialneedscafe.com/yogaforbraininjury.html

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”
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/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.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:

SESSION 16 – MAINTENANCE – Creating a Healthy Future

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”
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 Nuero program.

1. ________________________________________________________________________
2. ________________________________________________________________________
3. ________________________________________________________________________
4. ________________________________________________________________________
5. ________________________________________________________________________
6. ________________________________________________________________________

Suggest ways to overcome the barriers listed above

1. ________________________________________________________________________
2. ________________________________________________________________________
3. ________________________________________________________________________
4. ________________________________________________________________________
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 NOTICE
BAYLOR RESEARCH INSTITUTE
Baylor Institute for Rehabilitation
Dallas, Texas

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

TELEPHONE NUMBER:

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. If 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 (pre-injury)? 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?
   o Grammar school
   o High school or equivalent
   o Vocational/technical school (2 year)
   o Some college
   o Bachelor’s Degree
   o Master’s Degree
   o Doctoral Degree
   o Professional Degree (MD, JD, etc.)
Which of the following best describes the area you live in?
   o Urban
   o Suburban
   o Rural

How much time do you usually spend sitting or reclining on a typical day?
Pre-Injury (Hours:Minutes) ___________
Post-Injury (Hours:Minutes) ___________

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

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

What is your current household income in U.S. dollars (pre-injury)?
   o Under $10,000
   o $10,000-$19,999
   o $20,000-$29,000
   o $30,000-$39,000
   o $40,000-$49,000
   o $50,000-$74,000
   o $75,000-$99,000
   o $100,000-$150,000
   o Over $150,000
   o 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

| FIM physical score: |
| FIM cognitive score: |
| FIM total: |
| FIM efficiency: |
| Mobility: |
| Chair, walker, cane, independent |
| Apathy Evaluation score: |
| Awareness Questionnaire: |
| Trail Making Test score: |
| Hopkins Verbal Learning Test: |
| MPAI-4: |
| -abilities |
| -participation |
| -adjustment |
| Total MPAI-4 |
| Glasgow Coma Scale |
| Eyes: |
| Verbal: |
| Motor: |
REFERENCES


