

CarePartners Orthotics and Prosthetics

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Abstract

The loss of a limb can be the result of health conditions or an accident and an artificial limb has to be put in its place. The motive for this project was to research and discover an outcome survey for therapists and physicians to use to analyze the progress of their clients at CarePartners in the Orthotics and Prosthetics department. Outcome measures are used in standardized instruments for clinical and research settings to evaluate change in the health status of an individual, group or population based upon a series of interventions. Measuring outcomes can be helpful in determining the effectiveness of a fitting for patients with prosthetics. As a patient becomes closer to the end of their therapy care, their outcome is measured to evaluate the success of the therapy or services.

This project implements the use of outcome measures to determine the comfort level of the prosthetics provided to patients by the therapists working at CarePartners. Many functional outcome surveys used in today's clinical settings ask questions about mobility and general questions about the quality of life with a prosthetic. Not as many patients receive surveys that include questions about how their socket fits and their comfort level wearing their prosthesis. CarePartners wanted to incorporate a mandatory comfort socket survey after their patients were fitted with their prosthetics. I observed prosthetics fittings for patients, and then I researched different types of outcome measures that included an aspect of comfort and satisfaction. I found that the Orthotics and Prosthetic User Survey (OPUS) would be the most effective in analyzing a patient's comfort. This outcome measure survey advances their ability to accurately accommodate the patients in their fittings and creating the feeling of a realistic limb.

Origins of Project

CarePartners has been around since 1938 but was previously known as Asheville Orthopedic Home, Inc. After the 1940's polio epidemic, there became an increased need for the services that Asheville Orthopedic home, Inc. had to offer. After a vaccine was created for polio, the focus of their business turned to rehabilitation.

CarePartners offers a range of services to assist patients with the ability to rehabilitate themselves after an injury. CarePartners Orthotics and Prosthetics develops and fits custom orthotic and prosthetic devices for its patients using technology, materials, and research. The first step in the fitting process is an evaluation where a patient's medical history is reviewed, measurements are taken, and an impression is made to fit an artificial limb or brace. The next step is the fabrication of the limb or brace, and the fitting to test the fit and comfort of the device they created follows this. Lastly, adjustment and repairs are made to create the right fit based on the patient's need or lifestyle.

The project originates from the desire to improve the care for amputee patients. It is often a difficult transition for amputees to resume their daily life of activities and mental wellbeing. CarePartners wanted to incorporate a comfort survey, which would allow them to make this transition easier for the patient. This survey enables CarePartners to understand the areas they are doing well and the areas that need improvement. They are an organization that is constantly trying to improve their health care procedures and, ultimately, the health status of the individuals in the Asheville community.

Weeks after a patient's amputation, the patient has to work towards increasing balance and functional skills needed throughout their day. An important part of the prosthesis phase is the quality of the interface between the stump and an artificial prosthesis. The prosthesis must fit snugly over the stump, and the actual socket determines the amputee's comfort and ability to control an artificial limb. "Since the 1980s, prosthetic clinicians and researchers worldwide have made breakthroughs in design and materials that have greatly improved the connection between the socket and stump" (Marks, et al 2001). After a person experiences an amputation, they will be faced with a change in their daily needs and lifestyle. Amputees and their family members have to make sure that their environment is safe for them to function and specific places around the house are easily accessible. After a patient experiences amputation, CarePartners trains and educates the patient on how to take care for their limb. The patients learn about skin management, how to control swelling, doing daily activities, transfer techniques, stretching, and strengthening. Patients also learn home safety, stair climbing, and maintaining the health and cleanliness of the remaining limb. Amputees must go through months to maybe years of therapy to adjust and recover from the absence of their limb. Types of treatment for amputees are physical therapy, occupational therapy, psychology, and nursing. These types of rehabilitation are crucial in the steps of full recovery. "Worse health outcomes are often associated with poor

rehabilitation results in people with lower limb loss. For example, people with lower limb loss who experience depression also more commonly report less use of a prosthetic limb, higher perceived vulnerability, and lower self-rated overall health” (Amtmann, Morgan, Kim, Hafner, et al 2015). CarePartners wants their patients to be satisfied with their prosthetic so they will actually want to use it and live their lives to the fullest.

Methods

My area of interest is in physical therapy and rehabilitation, so I met with my faculty advisor Dr. Garbe to find a place where I could further my research and knowledge in this area. She suggested working with CarePartners and put me in contact with their volunteer coordinator. The coordinator met with me and suggested I work with their Orthotics and Prosthetics department. She put me in contact with my community advisor, Wilder LaFond, to find out what project his organization needed. He expressed to me that he had been trying to implement a new survey for his patients to fill out after they were fitted with a prosthesis. He wanted the survey to include questions about comfort so he knew what was working and so he could change what was not working in the organization. I also went to the CarePartners clinic to talk to the physical therapists, occupational therapists, and the personnel that fit and designed braces. I interviewed them on the desired outcomes they wanted from this project and the types of question they suggested should be in the survey. They wanted questions about abrasions or irritations from the brace and about patient satisfaction with their artificial limb.

The methods used to find a survey for the patients at CarePartners involved researching different databases and websites. The databases searched were the PubMed, Science Direct, JSTOR, and EBSCO host. The EBSCO host was the most resourceful because it directly focuses on rehabilitation and physical therapy, and this is where I found the OPUS. After I found a few different types of surveys, I showed them to Wilder to see which one he felt was the best fit. Once he approved the OPUS, he wanted me to find a set of normative data to go along with the survey so he could compare his results to the results of other clinics. Wilder approved of the OPUS the most because it questioned the comfort and strength perceived by the patient, and a few questions related to how patients felt about the cost and expenditures needed to have a prosthesis.

Once we agreed on a survey, the next step was to give the survey to post-procedural patients and discover how they felt about the questions. I gave the survey to patients who recently received their prostheses and had been wearing it for a couple weeks to see if the questions were easily understood by the patients. The patients that I gave the survey to seemed pleased with the questions and the future use of it by CarePartners. The next step was meeting with Wilder and discussing what patients thought of the survey and moving forward with showing the survey to the staff at CarePartners for their input. I re-created the layout of the survey in Excel to add the CarePartners logo and added a 1-5 scale for the “strongly agree” to the “least likely agree”

answers. I also added a total box at the bottom so Wilder could tally their points at the end of the survey for an overall total of their comfort with the prosthesis. I put together a presentation for the employees who were the physical therapist, brace fitters, and creators of prosthesis. I wanted to get feedback and ideas from them on how they felt about the survey questions and how they felt integrating this survey into their practice. I received positive feedback from all parties and I was happy that this project allowed me to provide a service and information to the CarePartners community.

Challenges

I encountered several challenges while attempting to complete this project. The first challenge I faced was being unable to observe fittings that would be helpful in my research project. Either patients would not show up for their fitting appointments, or they were not the ideal patient to get results from for an outcome measures questionnaire. Eventually, I observed fittings. Observing the fitting helped in deciding which survey to use because I saw how they measured components and sizes for patients. The fittings also showed me how they measured a patient's gait and body mechanics of the full functioning leg to use those numbers in emulating the artificial one.

Once I began my research on outcome measures, it was difficult to find questionnaires that asked questions in regards to fit and comfort. Many surveys I found focused more on the patient's ability to be mobile and return to everyday activities. I found this to be disappointing because for patients new to their prosthetic, they should be asked question on how comfortable their prosthetic is for them. Knowing this information is helpful not only for the patient but also for the therapist and physicians as well. I was able to conquer this challenge in my research by continuing to read as many articles as I needed to find the appropriate instrument. . The articles that were the most helpful to me were articles on research studies where outcome measure surveys asked questions about comfort levels.

Witnessing the struggle faced by amputees was a challenge for me as well because I can't imagine the difficulty adjusting to a new limb. I believe this is a major issue, and CarePartners Orthotics and Prosthetics tries to make the transition as easy as possible for these patients. "One of the greatest difficulties in fitting an artificial limb after amputations in general, and particularly after amputations of the thigh, has lain in the method of attachment of false limb to the living stump. The ideal must be so to connect these two that the prosthesis shall partake of all movements of the stump in all directions as though it were part of it. Any movement, whether longitudinal or angular, which occurs between the socket of the artificial limb and the stump-what is called by mechanical 'lost motion' is a source of weakness, gives rise to troubles in the skin of the stump, and is to be eliminated as far as possible" (Marks, et al 2001). It was difficult at times for me to work with this demographic of patients because they would express to me some of the issues they were having with losing a part of themselves. I could sympathize with these patients, but, at times, I was left speechless for words of comfort to give them. I realized

that these patients didn't need words of comfort or encouragement but simply to have someone listen to them.

Project Outcomes

After researching different types of surveys I found that Orthotics Prosthetic User Survey would be the most effective representation in knowing the patient's satisfaction of a prosthetic and services of the clinic. The Orthotics Prosthetic User Survey is from the Rehabilitation Institute of Chicago. Example questions from this survey are "My prosthesis/orthosis is pain free to wear" and "is your skin free from abrasions and irritations?" The survey also has questions on health care cost, such as if they were able to purchase and maintain their prosthesis with out-of-pocket expenses. After I got the survey approved by my community advisor, I went to post-procedural appointments for patients. The research that I have done has positively impacted this organization and the community they serve.

The community partner will benefit from this survey because they can provide better services, accommodation, and products for their patients living in that community. I feel that attention needs to be given to the lack of outcome measure surveys that question if the patient is comfortable and satisfied with their final product because they are the ones having to wear them for the rest of their life. I had the patients write any comments or question they wanted to share about the survey. All of the comments were in support of the use of the survey, and patients felt it would be useful for the organization and for future patients. I hope that this outcome measure survey will continued to be used with their department because I feel that it is a great tool to measure patient satisfaction.

Ties to Academia

I came into the University of North Carolina Asheville as a transfer student, and this is my last year at the university. I am a Health and Wellness Promotion major, and this project is connected with the courses I have taken over my years. In my pathophysiology class, I learned how diseases like diabetes and gout could lead to amputations in individuals. Diabetes causes neuropathy, which is nerve damage, and this creates a numbness in the feet. This nerve damage can cause an individual to be less aware of injuries and foot ulcers. If these injuries or ulcers are not treated, they become infected and don't heal properly leading to amputations.

Service-learning opportunities were provided in a few of the classes I took in the Health and Wellness Department. In these service-learning opportunities, I was able to be a part of local organizations and witness and serve the needs of our community. Service-learning projects and this community engaged scholar project has taught me professional skills, such as communication, organization, and time management. I have worked with Brother Wolf Animal Rescue by taking care of their dogs, helping organize events to find homes for dogs, and

promoting their organization in the community. I have also worked with the Shiloh Community Organization by helping host events in their neighborhood, working in their community garden, and trying to build a strong community. Having these previous service-learning experiences has helped me value the importance of being involved in the society around me.

Providing this service for CarePartners helps promote and enhance a healthy lifestyle in individuals, especially those that do not know how to manage the change in their health due to rehabilitation. For patients to be able to see and feel their artificial limb at the same time helps create an illusion in the brain that the limb is a part of their body (Sanders, et al 2011). In my health class theory and practice, I learned how organizations plan and implement programs into their organization. The program planning models learned in this class can be applied to the steps I took to initiate the outcome survey into CarePartners. Also, in this class, we learned about surveys and clinical research that also applies to how I conducted my research for this topic. In my health classes, I have learned about health promotion and prevention methods, as well as helping individuals overcome health adversities. Learning about health adversities and different groups of people with disease and disability gave me more empathy in working with this demographic. Taking classes, such as anatomy, mental and emotional health, and pathophysiology, gave me general knowledge of the body and the type of stress that it can be put under. I value the relationship and connection that the university has with community partners because it keeps the students involved in their school community and the neighboring community of the city.

Conclusion

CarePartners Orthotics and Prosthetics Department creates a comfortable and resourceful environment for those in need of their care. I have experience and knowledge in rehabilitation; however, this was my first experience working with amputees. Beginning this project, I was nervous to work with this demographic because of my unfamiliarity with amputations. I thought that every patient would appear to be sad because of the major mental and physical health change that comes with replacing a limb, but every patient I met were optimistic about their condition despite being sad about changes in their lives. The patients were receptive to me being there during their fittings and exposing the area of where their limb used to be. I am happy to work with CarePartners and assist them in the implementation of this outcome measure survey to better assist them in the care of their patients. I was able to watch the process of prostheses being made and customized to fit patients. I have learned the technology and time put into prostheses and found it fascinating how people can imitate the limb of a human. “Over time, a leg prostheses have improved in design, but have incapable of actively adapting to different walking velocities in a manner comparable to a biological limb” (Herr, et al 2011). This project along with other service-learning experiences gives me more of an appreciation for what I have in my life and made me aware of what others around me might not have. It was a great opportunity to work with the individuals over at CarePartners, and I am thankful for them being eager to

involve me in the progression of their business. I always want to make a change in the lives of others around me, and even though this is a small change that was made, it still matters in the bigger picture. Overall, I am how happy with the success of this project and the information that I will take away from this experience.

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