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ENTRY LEVEL THERAPISTS' PERCEIVED READINESS TO PRESCRIBE LOW-
TECHNOLOGY ADAPTIVE EQUIPMENT TO GERIATRIC POPULATIONS

by

Russell Wood

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Science
Department of Occupational Therapy

Western Michigan University
Kalamazoo, Michigan
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2006

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Russell Wood

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Russell Wood, M.S.

Western Michigan University, 2006

In this research entry-level therapists' were questioned about their readiness to prescribe low-technology adaptive equipment to geriatric populations. The analysis of 33 returned questionnaires have been discussed, with the overall results indicating that experience, familiarity, and education of specific equipment are all significantly related to the confidence levels of entry-level therapists in prescribing those equipment.

Additionally, the results of specific analysis for the groups of equipment, namely dressing, bathing and toileting were entertained. Open ended questions regarding equipment usage, follow up and trends are also discussed. Finally prediction equations are shared resulting from statistical analysis.

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INTRODUCTION

Angelica Grigsby (personal communication, February 21, 2006), the Accreditation Program Coordinator of the American Occupational Therapy Association informed me that fourteen thousand new occupational therapists entered the vocation in 2005. Each of these new therapists had the same professional responsibilities as seasoned veterans in regards to the prescription of adaptive equipment in the geriatric population. The purpose of this study is to evaluate new therapists' perception of their readiness to prescribe said equipment. Disuse of aides among the older population has been studied for many years with little overall effect among the non-use rate. The study of entry-level therapists in this aspect is a new venture in the occupational therapy literature. The following is the literature reviews that lead this researcher to ask specific questions of 33 new therapists about being ready to recommend adaptive devices.

PROJECT DESCRIPTION

The Technology-Related Assistance for Individuals with Disabilities Act of 1988 defines assistive technology as "any item, piece of equipment, or product system, whether acquired commercially off-the-shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities" (Bain, 1998 p.498). Kraskowsky and Finlayson (2001) note that words "adaptive equipment," "adaptive device," "assistive device," "assistive technology" and "aids" are all interchangeably defined as "any object or tool that maximizes a person's independence in activities of daily living." Some of the adaptive devices in this thesis would normally be termed durable medical equipment; however, this researcher is using the term adaptive equipment to describe all the devices used in the study.

This study focused on low-technology adaptive equipment for individual activities of daily living. Activities of daily living are personal self-maintenance tasks including grooming, oral hygiene, bathing/showering, toilet hygiene, personal device care, dressing, feeding and eating, medication routine, health maintenance, socialization, functional communication, functional mobility, community mobility, emergency response, and sexual expression (American Occupational Therapy Association [AOTA], 1994). Specifically this study focused on adaptive devices for dressing, bathing and toileting. The low-technology self-maintenance pieces of adaptive equipment in the questionnaire included: sock aide, reacher, shower chair, bath bench, long handled scrub brush, shower wand, grab bars, three in one commode, raised toilet seat, safety frame, and tub rail. Kraskowsky & Finlayson (2001) stated that occupational therapists are trained in adapting activities and environments to help patients' complete daily occupational engagements. Occupational therapists analyze daily tasks to determine why a client is having difficulty completing them independently, then they modify the activity or change the surrounding environment to increase the client's success potential.

CHRONOLOGICAL REVIEW OF LITERATURE

A review of available literature concerning adaptive equipment, its usage, and prescription effectiveness amongst the geriatric population will be mentioned here in a chronological order. The questionnaire used in this study is based from the findings and recommendations listed by these prior researchers.

In 1979, a study was done by J. Stowe entitled, "Aids – Who uses them." This study was carried out in Leeds, England, with the subjects being chosen from the clientele listing from local hospitals. The survey size was 150 patients discharged between six

months and two years previous. Each participant was interviewed by an occupational therapist that was trained in research. Questionnaire items included demographics, housing, toileting and bathing facilities, prior level of training on the specific adaptive device, and individuals who made the referral for assistive devices. Study results indicated seventy percent of those studied were greater than or equal to 60 years of age or older and 38 percent lived alone. The researchers found a large percentage of patients unable to bathe independently at home despite training in the hospital.

Stowe (1979) indicates two possible reasons for disuse; 1) the items were not suitable, and 2) the patient forgot how to use them. Within the report by Stowe (1979) was a follow-up second inquiry of 100 additional patients that met the same criteria as that in the previously mentioned study. This follow-up study focused on the prompt delivery and training of the assistive devices in the home after discharge from a rehabilitation setting. The control and treatment groups were assigned using random selection tables. The control group received their training and adaptive devices in the normal manner. The treatment group received prompt, in-home visits from the occupational therapist and received specific follow-up instructions on the safe use of the equipment. This second study found that 100 percent of the treatment group was able to bathe themselves with the use of aides. The control group, on the other hand, reported only 80 percent bathing independence. Stowe (1979) suggested that an occupational therapist liaison between the patient and the hospital was helpful to increase the effectiveness of the prescribed adaptive device. Another recommendation was that patients should not be discharged without a follow-up visit or phone call to ensure the effective use of the equipment.

Three years later M. S. Seeger and L. A. Fisher (1982) conducted a study, of patients with total hip and surface replacements, to report on the success of a program implemented in an acute rehabilitation setting. The program was designed to instruct inpatients in the use and benefit of selected adaptive equipment. These items included: long handled reacher, high chair, raised toilet seat, tub bench, long-handled scrub brush, hand-held shower extension, stocking cone, long handled shoe horn, and elastic shoe laces. Aids and environmental adaptations were used to increase the patients' activities of daily living. The survey had a 69 percent return rate with an age range of 16 – 81 years old. The mean age of the participants was 53 years old with a median value of 57 years. The standardized assessment named Joint Replacement Evaluation was used to determine the patient's living situation, vocational duties, household responsibilities, and level of independence before surgery. Results indicate that 88 to 99 percent of all adaptive equipment issued from the hospital was used at least once. The article indicated the frequency of equipment use ranged from "always" to "never." Over half of the participants surveyed said they always used the raised toilet seat, tub bench, elastic shoelaces, and the long handled shoe horn. Among the items highest in percentage labeled as "never used" were the sock cone and bath sponge. All adaptive equipment was used for longer than the three month precautionary period, with the exception of raised toilet seats and long handled shoe horns.

Independence was achieved at: a) 57 percent for dressing, b) 48 percent for bathing, c) 72 percent for personal hygiene, and d) 48 percent for car transfer. This was at or around the time of the patient's discharge from skilled therapy services. As the study turned more longitudinal from about two months to one year after discharge, the percent of

independent living increased to about 90 percent without the use of aids. Seeger et al. (1982) indicate that after two months of discharge, the majority of patients discontinued the use of adaptive equipment because it was no longer needed. If the equipment was only needed for such a short time, perhaps a different approach, such as renting equipment, would have been more advisable. Also, there is no mention of what happened to the equipment after it was discontinued.

The authors were pleased with the high-usage rate of equipment directly after discharge from the hospital. The article failed to inform the reader of the experience level of the prescribing occupational therapists and exactly what type of follow-up was given at home to increase the use of such aids.

Bynum and Rogers (1987) studied the use and effectiveness of assistive devices by 30 recipients of home care service. According to these researchers, assistive devices are often recommended by occupational therapists to improve the functional ability of patients. These adaptive devices are often used to compensate for impaired motion, muscular strength, endurance, manual dexterity, and mobility. The need for assistive devices is based on the evaluation of the patient by the certified therapist. The evaluation was based on the patient's motor, cognitive, and attitude traits.

The 30 subjects for this study were obtained from a home health agency in a large rural area. Patients were chosen based on the type of adaptive device received in rehabilitation and their ages ranged from 37 to 91, with the average age being 68. The specific adaptive devices chosen for this study include: rocker knife, long-handled scrub sponge, long-handled shoe horn, elastic shoelaces, sock aid, reacher, bedside commode, elevated toilet seat, commode armrest, bathtub bench, and shower chair. The varieties of

diagnoses included in the study were stroke, rheumatoid arthritis, quadriplegia, closed-head trauma, degenerative joint disease, Parkinson's disease, and generalized weakness.

A structured questionnaire was used in a face-to-face interview in the participant's home. The questions focused on demographics, adaptive equipment usage, effectiveness, and training. The average number of adaptive devices owned by participants was 1.8, ranging from 1-5. Usage rate of the items was 81.5 percent. The bedside commodes had the largest number in use, but only 39 percent were used independently. Those who were independent had indicated they regarded this activity of daily living as highly important to them. Conversely, those who still needed assistance with toileting using a bedside commode had not placed a high value on toileting independently. The study suggests that with a 69 percent usage rate, the impaired individuals must have had options for the completion of their activities of daily living, such as family members, or some existing social support system. Bynum et al. (1987) continued by indicating that several devices were not used because of unaccommodating architectural factors, and/or the patient had physical conditions preventing their use. Furthermore, the suggestion was made that these mistakes could have been anticipated and prevented with a thorough evaluation of the patient and the living situation. There were two specific examples included in the study. First a bedside commode was prescribed to an individual that had a colostomy and a catheter, who therefore was unable to use it, and the second was unused because the commode was too small to accommodate the client's obesity. These conditions existed at the time of prescription.

The researchers cautioned that the findings reported that the use of physical help from another person was associated with a failure to value independence in the activity for

which help was needed. It is likely that the individual who is unable to perform independently may devalue independence to preserve their personal integrity.

Device training was rated as adequate by those patients who received the training. It seems that for many patients, the operation of the device was obvious and instruction was not needed. Nevertheless, some patients did experience problems with the devices, and many required human assistance in addition to the device. The author questions if ineffectiveness is due to user ability to use the product or if the equipment design is not user friendly. The small study population leads the reader to question the application of the findings upon the general population. It was suggested that future studies need to examine usage in relation to user characteristics and device features.

Neville-Jan, A., Piersol, C. V., Kielhofner, G., & Davis, K. (1993) wrote an article to describe patient utilization of adaptive equipment. A survey questionnaire was designed to: a) determine the rate of utilization of equipment, b) type of training or instruction received, c) reasons for non-utilization, d) identify equipment that might be needed, and e) receive comments regarding improving the equipment of training. Questionnaires were mailed to 80 potential participants. The response rate was 78 percent. Twelve of the received questionnaires were eliminated due to the questionnaire being incomplete, leaving 50 participants. Those who were included in the study owned a total of 92 devices. Subjects were chosen from the Department of Veterans Affairs Medical Center in Massachusetts's consecutive patient record over a three-month period. Only those patients who received permanently issued adaptive equipment and were discharged greater than three months earlier were included in the study. No mentions of any attempts to randomize the study were indicated.

The study was started because during home visits, the home health occupational therapist observed that equipment sometimes did not fit properly, remained in boxes that had never been opened, or patients had more than one of the same items. Neville-Jan et al. (1993) found that 15 percent of the equipment was never used and that 21 percent of the equipment was only used for a period of time. The rate of non-utilization, at the time of the survey, was 36 percent. The authors listed several reasons adaptive devices were not used, including: equipment did not fit, didn't know how to use it, could not be installed, help was needed, equipment got in the way, didn't feel safe, poor aesthetics, afraid the equipment would damage property, didn't like to use special equipment, and the items were broken or worn out. The varied reasons for non-utilization indicate the importance of individualized treatment planning as opposed to issuing equipment based on diagnosis. Only eight percent of those studied received training on the devices at home.

The authors suggest that the non-participants might not have been using the devices and did not reply out of fear. Several of the participants had phoned the research group with concerns that equipment would be confiscated with the self reports of non-use. Neville-Jan, et al. (1993), indicates that since some patients' functioning improved over time, it was fairly common to only need the equipment for a month or two after the prescription was issued. Patients, it was suggested, could be issued equipment on a temporary loan basis and the equipment be retrieved when no longer needed.

As this study team considered the results, two main thoughts arose as important areas for further consideration. First, attention must be given to how therapy students are taught to issue equipment. Are they taught based on diagnosis or are they taught to

consider the patient's environment, goals, values, and daily routines? Secondly, it would be helpful to investigate if there is a difference between what is taught in the schools and what is actually occurring in the clinics.

In the work by Mann, W. C., Hurren, D., & Machiko, T. (1993), assistive device usage by, non-institutionalized, elderly persons with visual, cognitive, and physical disabilities was studied. Subjects were selected from 16 service organizations from the Western New York area. The study included 157 participants. The participants were assigned to one of seven groups using the following standardized tests: a) Sickness Impact Profile (SIP) – Physical Dysfunction Section, b) Older Americans Resources and Services Program Multidimensional Functional Assessment Questionnaire, and c) Mini Mental State Exam. Two other standardized assessments were used to determine pain and function, namely: 1) Jette Functional Pain Index, and 2) Functional Independence Measure.

Overall, subjects used an average of 79 percent of the adaptive devices they owned. However, the participants were only satisfied with 72 percent of the devices they owned. Subjects expressed a need for additional devices. Interestingly, the patients were not able to receive the additional items because they were too expensive or/and were not reimbursable under third party payment systems. More than half the devices were purchased out of pocket. According to Mann, et al. (1993), many older persons delay the purchase of a device because they are not sure that they really need it or that the device will work if they get it. Although more investigation is needed in this area, the results suggest the need for professional assistance in assessing and recommending assistive

devices. Therapists must consider an at-risk older person's need for assistive devices in light of multiple impairments and chronic conditions.

Mann, et al. (1993) indicates correcting errors with assistive device prescriptions start with an informed service provider, typically an occupational therapist. An assessment of the person, the home, and the current use of devices is performed. Based on the evaluation, some of the current adaptive equipment devices could be replaced with more efficient and effective items. These devices might be modified or repaired. In some cases, assistive devices may not be the best solution, and personal care services may be required. Need for an assistive device to compensate for an impairment may change with time; many persons improve after an acute illness, a stroke, or hip surgery. Others will show a decline in functional status. Assessment, therefore, must be an ongoing process involving the person, the family, and all service providers.

Ruth Smith (1995) found that many studies of individuals with physical disabilities had revealed significant under-use of adaptive equipment following initial rehabilitation. She further indicates that the client failed to use the equipment because the prescribed equipment focused on the physical aspect of treatment and failed to incorporate client-centered factors. The study was hoping to encourage a more client-centered model for equipment prescription. The therapist's role has changed from actually designing and fabricating the equipment to that of evaluating, recommending, and teaching the client to use the prescribed equipment. R. Smith (1995) indicates clinical reasoning determines the actual problems that will be addressed based on the patient's interaction with the therapist. Using the client's goals, the therapist determines which performance components need improvement and optimizes the use of specific client strengths.

Compensatory methods are then considered to improve performance. If the therapist determines that regained ability and compensatory strategies are inadequate to meet the client's goals, simple equipment is considered. Equipment must allow for safety and ease of application and use. It must be well constructed and minimize potential for breakdown.

Primary factors for therapists to consider in selecting self-help devices are: a) the nature of the disability or condition, b) the ability to cognitively use the device, c) the potential of the device to improve functional abilities, d) the possibility that a technique could replace the device, e) the cost issues, f) the motivation of the patient to use self-help devices, and g) the possibility that the client will continue to require assistance (Smith, 1995). The study concluded that over-reliance on the physical and procedural aspect, such as hip or knee adaptive equipment kits, causes therapists to make equipment recommendations which are not compatible with the client's needs, roles, values, and real living environment. Further more, clients fail to use equipment because the therapist's prescription focuses on the physical aspects of treatment and fails to incorporate client-centered factors.

N. I. Edwards, and D. E. Jones (1998) performed a study to determine the ownership and use of various assistive devices by older people living at home. The 1,405 subjects used were drawn from a pool of about 1.6 million. A randomizing computer program was used to select those participants who reflected the general population of England and Wales. Fifty-seven percent of the participants ranged in age from 65-74, with the remainder being 75 years and older. Each subject was interviewed in his/her home by a trained, experienced fieldworker using a structured interview schedule. Using the

Townsend scoring system, the researchers labeled the participants as one of four categories: 1) no disabilities, 2) some disabilities, 3) moderate disabilities, and 4) severe disabilities. The interviewer asked specific questions about many assistive devices related to mobility, bathroom, and bedroom. Devices relative to the study included: lavatory rail, raised toilet seat, bathroom rail, bath seat, and bath board. The Mantel-Haenszel test was used to test for trends. Results conclude that 64 to 92 percent of the aids were used. This study found: a) 18 percent of the toilet rails, b) 23 percent of raised toilet seats, c) 10 percent of bath grab bars, d) 36 percent of bath seats, and e) 28 percent of bath boards were not used but were prescribed.

Edwards et al. (1998) indicate that knowledge of the pattern of ownership and use of disability aids is important when working with older people in their own homes. Ownership of aids varied with increasing disabilities, but it was alarming that many severely disabled people lacked relatively basic low-cost aids and adaptive equipment. Furthermore, the researchers concluded that relatively simple, inexpensive equipment would markedly contribute to increased independence. The authors recommended that knowledge of who owns and who uses equipment and under what circumstances may also assist service providers in planning future goals. A heightened awareness of the availability, cost, and importance of the various assistive devices is needed to promote independence of personal activities of daily living. Follow-up and community involvement are also recommended in this study.

Weilandt, T., McKenna, K. Tooth, L., & Strong, J. (2001) audited 64 patients of senior citizen age who were discharged from a metropolitan hospital. The adaptive devices were prescribed by occupational therapists, and included shower stools, shower

chairs, bath boards, hand-held shower hoses, toe wipers, soap bags, non-slip mats, and long-handled back brushes. An overall usage rate of 71.1 percent was reported for the 90 items prescribed. This ranged from 0 percent for long-handled back brushes to 100 percent for shower stools. Factors found to play a role in the use of equipment included: a) patient's perception of the benefits, b) patient's involvement in the selection, c) patient's training received, and d) patient's social support. The authors recommend the need for a more patient-centered approach in the process of prescribing adaptive equipment.

In 2001, L. H. Kraskowsky, & M. Finlayson analyzed fourteen studies involving older adults to discover similarities and differences in adaptive equipment use. The dates of these published research articles range from 1980 to 1998. All studies were made up of adults 55 years old. Both cross-sectional and longitudinal designs are represented in the study. The overall usage rates ranged from 75 percent to 82 percent, with the lowest reported usage rate of 47 percent. The most frequently used adaptive equipment devices were bathroom and mobility aids. The most common factors identified in the literature as having a statistically significant association with adaptive equipment use were: a) age, b) gender, c) education, d) living arrangement, e) marital status, f) income, g) health condition, and h) length of time since discharge. It was reported that device users were less educated and more likely to be living alone and single. Most device users had lower incomes and were less healthy.

The two most commonly identified reasons for nonuse of assistive devices were, first the unsuitability of the aid. Patients clarified unsuitable as being ineffective, a bad fit, or the equipment failed. The second most common reported reason for nonuse was poor

aesthetics. Aesthetics was defined as not fitting in with the existing style or furniture. Kraskowsky et al. (2001) emphasized the need to monitor equipment use with follow-up completed by an occupational therapist. As a conclusion, the authors indicated that 23 percent of older adults in United States communities used adaptive equipment. This further indicated that with the dramatically increasing numbers of older adults, this rate of use has potential implications for occupational therapists. Even modest rates of nonuse could result in a tremendous financial burden in the health care system and the people it serves. The fulfillment of this obligation can be accomplished through research, continuing education, and listening to the needs and concerns of each client.

RESEARCH METHODS

Subjects

There were 80 surveys mailed to entry-level occupational therapists who graduated from an accredited university. These candidates were randomly chosen from a list obtained from the American Occupational Therapy Association. Mailing lists provided by the American Occupational Therapy Association, Inc. were randomized before printing. The participants were then selected from a pool of 200 names by putting all randomized names received in a collective pool and drawing out the first 80 names. To be included in this study participants must have met the following criteria: a) graduated from an accredited university or college with a Bachelors, Masters or Doctoral degree in Occupational Therapy, b) received a passing score on the National Board for Certification in Occupational Therapy, Inc.'s (NBCOT) certification examination, and c) have the title: Occupational Therapist Registered. The three exclusionary criteria included: 1) surveys were unused if the mailer is returned after the statistical analysis is

complete, however the late surveys may be mentioned in paper, 2) participants were not used if they had not passed the NBCOT's examination, and 3) if a potential participant had previously graduated with a degree in occupational therapy before obtaining their latest degree their responses were excluded.

Definition of Terms

Perceived readiness, in this study, is synonymous with words like confidence and assurance. To define these words, we turn to Merriam-Webster, Inc. (2005-2006). Confidence is defined as faith in oneself and one's powers. Assurance is defined as a strong implication of certainty. Readiness is defined as being prepared mentally or physically for some experience or action. Perceived readiness then is the feeling of strength and ability a person has to succeed in a task. It is an internal determination of how sure a person is of their skills. Lack of readiness suggests the respondent isn't sure he/she could complete the required responsibility successfully. This researcher believes that readiness to prescribe adaptive devices is based on three things: 1) familiarity with the item, 2) educational training, and 3) previous equipment experience.

Assistive devices are categorized in many different ways including their use of technology. A low-technology assistive device is an item that does not use electronics or electricity to power or maintain the item. An example of this classification of device is a foam handle build up on a utensil. A high-technology assistive device is an item that uses an electronic/electric medium to power or maintain the item. An environmental control unit is an example of a high-technology adaptive device. This study focused on bathing, dressing, and toileting adaptive equipment primarily to stay harmonious to the literature reviewed for this study. Seeger, et al. (1982), Bynum, et al. (1987), Edwards, et

al. (1998), and Weilandt, et al. (2001) studied various adaptive devices used to help in activities of daily living. Of those aides studied the ones chosen for this study included the most often studied from other studies. The shower chair used in this study, for example, was included in all four previous studies afore mentioned. The questioning of grab bars and tub rails were the exception to this method and were included at the researchers' discretion.

PROCEDURE

This research used a quantitative, non-experimental survey in the form of a questionnaire. The student investigator conducted this survey under the guidance of Western Michigan University's Occupational Therapy department of the College of Health and Human Services. Completed surveys and survey results were compiled and analyzed in Utah, where the student investigator lived, and then were returned to the faculty advisor at Western Michigan University where the surveys will be secured for at least three years to ensure confidentiality. The subjects were given three weeks to complete this survey. After the first week, a reminder postcard was sent to each individual to increase the return rate of survey return. Informed consent was explained in the letter that accompanied the survey. It stated that the subject had the right to choose to answer or not answer any question. If the participants chose not to participate in this survey, they were to either return the blank survey or discard it. The letter informed the subject that if he or she returned the survey it implied consent to use the answers they supplied.

The nature and likelihood of possible risks (physical, psychological, social) as a result of participating in the research were minimal. The inconvenience of completing the

survey was the only physical risks of this survey. A possible psychological risk, of responding to this questionnaire, included the chance that the subjects may feel discomfort with reporting on their educational experience. Lastly filling out the survey may uncover some feelings of inadequacy in the training received at school and thus cause a bit of social conflict.

Data Collection Instrument

Research project participants filled out a questionnaire and returned the survey in a pre-addressed stamped envelope. The survey included subject demographics. A Likert scale was used by participants to rate adaptive equipment familiarity, education, confidence, and experience. It also contained several open-ended questions related to prescribing bathing, dressing, and toileting low-technology adaptive devices. A copy of the survey is attached to this thesis. The survey took 30 minutes or less to complete. A follow-up post card was also mailed, after the initial mailing of the survey, to help increase the number of questionnaires returned.

RESULTS

Questionnaire

Thirty-seven of 80 surveys were returned, making a 46.25 percent return rate. Of the 37 questionnaires finished, two were not used because the participants had obtained degrees in and were practicing professionally as Certified Occupational Therapy Assistants before obtaining a higher degree in occupational therapy. An additional two were not used because they were not returned in time for the statistical analysis. Thirty-three returned surveys were used in the statistical analysis for this thesis.

Demographics

Twenty states were represented in the survey results. Three respondent locations were unknown because the envelopes came back without post marks, making it impossible to identify the regional response areas. The states with the highest representation of returned surveys, based on post marks, were California and Michigan, tallying in with three responses each. The respondents possible ages ranged from 18 to 40 based on the age categories available in the survey. There were no respondents that indicated they were older than 40. The break down of age ranges are displayed in figure one. Ninety-one percent of those who turned in the survey were female.

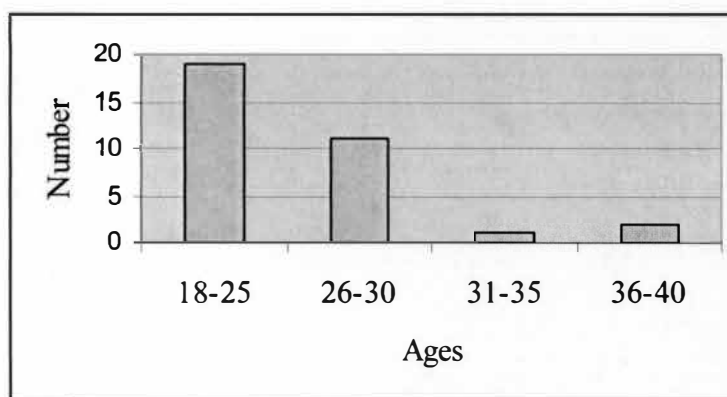


Figure 1: Subjects' Ages

All of the participants were employed as occupational therapists at the time of the survey. The majority of survey participants had earned their Bachelor's degree. There were no Doctorate degree level occupational therapists who responded to the study. The education results are displayed in figure two. The areas of experience varied greatly amongst the occupational therapists. The responses were not limited to one area of experience but could choose as many as were applicable. Their multiple responses put the most experiences in the geriatric and the pediatric settings. Figure three indicates the percentage of respondents' experiences.

Bachelor's Degree	21
Master's Degree	12
Doctoral Degree	0

Figure 2: Educational Level

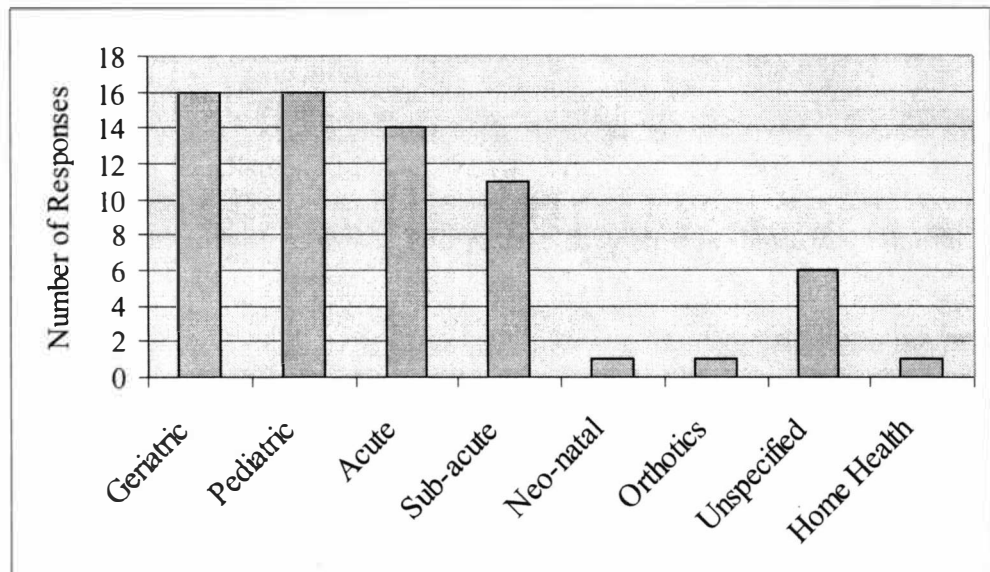


Figure 3: Areas of Experience

The National Board of Certification of Occupational Therapist (NBCOT) examination was passed by all those who had responded. This is not surprising considering the mailing list was obtained through the American Occupational Therapy Association (AOTA) and only contained those who had enlisted as new therapists to receive the discounted rate. The majority (80 percent) of the individuals who had passed the certification examination had done so at least six months prior to this mailing. Only one subject had passed his/her boards less than or equal to two months prior to this survey. Among the respondents, four had passed the test between the four to six months prior to the study. Within the returned surveys four respondents indicated they had previous experience in occupational therapy. Two of those four indicated previously working as Certified Occupational Therapy Assistant for more than or equal to five years and have

Certified Occupational Therapy Assistant for more than or equal to five years and have been excluded from the results of this survey. The other two respondents professing prior experience were included in the study because, by way of the response, they were not practicing as a licensed professional but as an aide or a helper in the therapy department.

Familiarity, Education, Confidence, and Experience

The purpose for this study was to determine the entry level therapists' perceived readiness in prescribing adaptive equipment to the geriatric population. Due to the lack of research on a specific formula to derive the means to determine 'readiness', the following model, figure four, was contrived to determine readiness levels. To explain the model, the researcher broke down the areas that lead to readiness/self confidence. As an analogy, the relationship between employee and employer will be discussed. Employers look for individuals with experience and with proper education. An employee that has experience in the job and is educated or trained to do the task will get a better job and perform the task more efficiently. This would hold true for an occupational therapist in prescribing a specific piece of adaptive equipment. If an experienced therapist used the clinical reasoning skills learned in school coupled with his familiarity with the item and his experience of what has worked in the past, she/he can make a successful prescription.

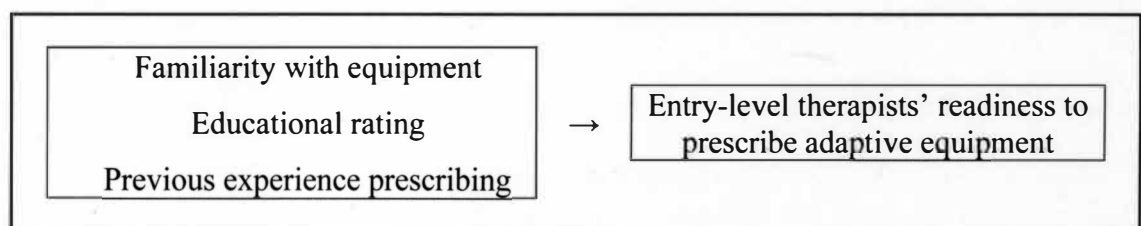


Figure 4: Readiness Model

The areas of adaptive equipment questioned with this survey include bathing, dressing and toileting. The specific adaptive devices for the three areas include: 1) bathing = shower chair, bath bench, long handled scrub brush, shower wand, grab bars and tub

rails, 2) dressing = sock aide and reacher, and 3) toileting = 3-in-1 commode, raised toilet seat, safety frame, and grab bars. Each subject was given a Likert scale chart to fill regarding adaptive devices, and the areas described in the model, namely: familiarity, educational rating, experience, and confidence. All areas used the Likert system on a one-through-five scale except for the experience column that called for a yes/no answer. An answer of yes indicated they had prescribed the device as an occupational therapist, and an answer of no meant they had not prescribed such equipment. An answer of “one” on the other columns would indicate a very negative response, while a “five” would indicate a very positive response. An answer of “three” would be a neutral response. Instead of addressing each individual adaptive item, each category (dressing, bathing, and toileting) has been averaged together to get an overall picture of the new therapist confidence level concerning equipment in these areas of daily living.

Bathing

Table 1: Correlation Matrix for Bathing

	Familiarity	Education	Experience	Confidence
Familiarity	1			
Education	0.4280	1		
Experience	*0.7081	0.4016	1	
Confidence	*0.6542	*0.5165	*0.7894	1
Critical values for r when n = 33 are:				
≥ .361 for alpha = 0.05, and				
≥ .463 for alpha = 0.01				

* = statistically significant at 0.01

The bathing adaptive equipment surveyed included shower chairs, bath benches, long handled scrub brushes, shower wands, grab bars and tub rails. The mean values for the area of bathing, in relation to the four questioned areas, are: Familiarity = 3.39, Education = 3.29, Experience = 0.65, and Confidence = 4.15. The participants reported a

confidence level between adequate and very adequate. According to the correlation statistics included in Table 1, familiarity ($r = 0.654$), education ($r = 0.516$), and experience ($r = 0.789$) are all significantly related ($s = 0.01$) to confidence in prescribing bathing equipment. However, because experience and familiarity are so highly related to each other ($r = 0.708$). Familiarity does not contribute to the regression model and was dropped, leaving experience and education as the only significant predictors of confidence with bathing equipment. The adjusted R Square regression statistics indicate that 68 percent of the difference in confidence levels seen in prescribing bathing adaptive equipment is explained by the level of experience and education of the therapist. This is explained in a confidence level of less than $s \leq 0.000000$, with 0.01 being significant.

Dressing

Table 2: Correlation Matrix for Dressing

	Familiarity	Education	Experience	Confidence
Familiarity	1			
Education	-0.0117	1		
Experience	*0.4853	0.0951	1	
Confidence	*0.6735	0.1050	*0.6775	1
Critical values for r when n = 33 are:				
≥ .361 for alpha = 0.05, and				
≥ .463 for alpha = 0.01				

* = statistically significant at 0.01

The dressing adaptive equipment surveyed included sock aides, and reachers. The mean values for the area of dressing, in relation to the four questioned areas, are: Familiarity = 4.00, Education 3.83, Experience = 0.88, and Confidence = 4.67. The participants reported a confidence level between adequate and very adequate. The mean averages for dressing are higher than those reported for bathing, with the most noticeable value change being that of confidence. There are only two items in the survey that would

be typically used for dressing as opposed to six used for bathing. The smaller amount of items may account for the higher confidence level. The correlation matrix involving confidence, which is included in Table 2, in prescribing dressing adaptive equipment shows that both experience ($r = 0.677$), and familiarity ($r = 0.674$) are significantly related ($s = 0.01$). Education ($r = -0.011$) was found not to be significantly related to the confidence level in dressing prescriptions. The adjusted R-Square regression statistics indicate that 59 percent of the difference in confidence levels seen in prescribing dressing adaptive equipment is explained by the level of experience and familiarity of the therapist. This is explained in a confidence level of $s = 0.000000$; with 0.01 being significant.

Results suggest the sock aid and reacher can be prescribed confidently depending on the therapists experience and familiarity with each item. The more hands-on time with the items and more interaction with clients the greater the confidence level. Although experience and education are also strongly related, including both variables in the regression equation adds significantly to the R-squared value.

Toileting

The toileting adaptive equipment surveyed included: 3-in-1 commodes, raised toilet seats, safety frames, and grab bars. The mean values for the area of toileting, in relation to the four questioned areas, are: Familiarity = 3.14, Education 2.89, Experience = 0.57, and Confidence = 3.67. The participants reported a confidence level between neutral and adequate. The mean values for toileting are the lowest of the three areas of daily living studied. Just over half of the therapists have any first-hand prescription experience with toileting adaptive equipment. Special note of interest is that with the decrease in core

mean values the confidence level also lowers. The educational rating for this area was rated as poor nearing fair. The correlation matrix involving confidence in prescribing toileting adaptive equipment, or Table 3, shows that experience ($r = 0.826$), familiarity ($r = 0.765$), and education ($r = 0.551$) are all significantly related ($s = 0.01$). Experience and familiarity are highly related to each other ($r = 0.695$), but familiarity still contributes to the regression model, adding nearly five percent to the adjusted R-squared value. Therefore all three independent variables were included in the regression analysis. The adjusted R Square regression statistics indicate that 76 percent of the difference in confidence levels seen in prescribing toileting adaptive equipment is explained by the level of experience, familiarity, and education of the therapist. This is explained in a confidence level of $s = 0.00060$; 0.01 being significant.

Table 3: Correlation Matrix for Toileting

	Familiarity	Education	Experience	Confidence
Familiarity	1			
Education	0.4198	1		
Experience	*0.6951	0.4103	1	
Confidence	*0.7649	*0.5511	*0.8257	1
Critical values for r when n = 35 are:				
≥ .361 for alpha = 0.05, and				
≥ .463 for alpha = 0.01				

* = statistically significant at 0.01

Overall Analysis

The overall analysis includes all the adaptive equipment surveyed. The mean values for the overall analysis, in relation to the four questioned areas, are: Familiarity = 3.48, Education 3.34, Experience = 0.70 and Confidence = 4.16. The participants reported an overall confidence level between adequate and very adequate. Overall, familiarity and education are close in numerical value, making them just above average. The experience

level indicates that seven out of the 10 entry-level therapists surveyed had prescription experience with at least one type of adaptive equipment studied. The overall confidence level from the subject group of entry-level therapist is 4.16, which is just above the level of “adequate.” Meaning that with all the education, familiarity, and experience the therapists receive, they feel adequate in prescribing adaptive equipment, in the profession of occupational therapists. Experience ($r = 0.849$), familiarity ($r = 0.704$), and education ($r = 0.424$) are all significantly related to confidence in prescribing adaptive equipment, see table 4. Experience and Familiarity are highly related to each other ($r = 0.707$). Experience and education are also related at the significant level $s = 0.05$ level. A regression analysis including all three variables reveals that only experience is a significant predictor of overall confidence. The conclusion of a Two-Factor Analysis of Variance Model performed on the data is that there appears to be no significant interaction between familiarity, education, and experience as they relate to dressing, bathing and toileting. However, there is a significant difference between the means of dressing, bathing, and toileting. The largest difference is between dressing and bathing. This suggests that entry-level therapists are, overall, less prepared to prescribe bathing and toileting equipment than dressing items.

Table 4: Overall Correlation Matrix

	Familiarity	Education	Experience	Confidence
Familiarity	1			
Education	0.2550	1		
Experience	*0.7070	0.3785	1	
Confidence	*0.7038	0.4240	*0.8487	1
Critical values for r when $n = 35$ are:				
$\geq .361$ for $\alpha = 0.05$, and				
$\geq .463$ for $\alpha = 0.01$				

* = statistically significant at 0.01

Prediction Equations

Based on statistical analysis, of the model and the respondents' answers, regression equations were formulated for dressing, bathing, and toileting confidence in prescribing equipment. These equations can be used to predict the confidence levels of entry-level therapists. Based on the entry-level therapists' responses to the Likert scale questions similar to those contained on the questionnaire, an employee or educator could predict the new therapists' confidence levels.

Mary, for example, goes into an interview where the employer wants to get a feel for how confident she is with prescribing dressing adaptive equipment. The employer has included in the employment papers Likert style questions about experience and familiarity with prescribing adaptive equipment. Mary answers a "yes" for experience and a "four" for familiarity in the application paperwork. Using her answers and the regression equation, we would get an estimation of her confidence levels. Mary's equation would look like this: Dressing confidence = $3.102 + [0.747 \times \text{Experience (1.00)}] + [(0.236 \times \text{Familiarity (4.00)}]$. Reduced it would read: Dressing confidence = $3.102 + 0.747 + 0.944$. Mary's predicted confidence level for prescribing dressing equipment equals 4.793, or very high confidence rating. The regression equations to gauge the confidence levels of entry-level therapists in prescribing adaptive equipment for dressing, bathing, and toileting are listed as follows, namely equation 1, equation 2, and equation 3.

- Equation 1 = Dressing confidence = $3.044 + (0.706 \times \text{Experience}) + (0.257 \times \text{Familiarity})$
- Equation 2 = Bathing confidence = $2.718 + (1.307 \times \text{Experience}) + (0.177 \times \text{Education})$

- Equation 3 = Toileting confidence = $1.254 + (1.509 \times \text{Experience}) + (0.312 \times \text{Familiarity}) + (0.199 \times \text{Education})$

OPEN ENDED QUESTIONS

1. Describe the follow up procedures taken for your patients concerning their adaptive equipment after discharge?

This question stems from the study done by Stowe (1979). The study focused on the effects that timely follow-up had on the use of adaptive equipment at home following discharge from the hospital. The results indicate that follow-up, in home, that specifically focused on the use of the adaptive equipment yielded a one hundred percent independence rate. With this in mind, the researcher of this study wanted to know if the readiness of entry-level therapists in prescribing adaptive equipment included a form of professional follow-up after the patients discharge. It was surprising to see that within the top answers were the responses: no follow-up, and no response at all. These responses suggest that follow-up is not an important factor to the entry level therapists. For a summary of the results see figure five.

2. What do you find most important in determining adaptive equipment needs?

The patients' ability to learn, or cognitive abilities, tied for the most important determinants in issuing adaptive equipment. The individuals support base of family, social, and self help was the other main determinant for the entry-level therapists. There were several responses to this question but only the top eight answers are shared with the reader, see figure six.

Follow-Up Procedures	Quantity
No Follow-up	5
Home Health referral	5
No Response	4
Home Evaluation with or without Family training	4
Must demonstrate independence before discharge	3
Phone call for delivery confirmation & feedback	3
Not applicable	3
Discharge to other inpatient rehab	2
Patient given work number it call if help is needed	2
Nursing Restorative Program	1
Other Disciplines follow up (social Work)	1
Training with pictures	1
Outpatient	1
Total	35

Figure 5: Follow-Up Procedures

3. What differences do you find between what you were taught in your academic program compared with your fieldwork assignments concerning adaptive equipment?

In academia, the teaching is designed to generally learn the items and get an understanding of what they look like. Responses indicate the training in the classroom was idealistic and safety focused. A few had some negative responses about their training which included that no training occurred or that not enough time had been allowed to adequately learn the items. One even went on to say nothing was learned in school about adaptive equipment. Respondents reported that there was a great deal more hands on training in fieldwork than in the classroom. In working with real patients, the whole person must be considered, including factors such as diagnosis, prior level of function, and cognition. Among the new things learned in fieldwork was the cost of the equipment, reimbursement, insurance coverage, and how to actually order the equipment. One respondent even said she had not seen a sock aid until her last fieldwork experience. It should be noted that even though the clinical fieldwork is a part of the curriculum of

education for accredited universities in becoming an occupational therapist. The researcher wanted to find out the perceived training done in the classroom verses the perceived training from clinical work.

Determining Factors for Adaptive Equipment	Responses
Ability to learn / Cognition	7
Patient / Family / Social support	7
Impairments / Physical restrictions / Ability to use	6
Needs of the patient	5
Cost	4
Safety	4
Desire / Motivation	3
Increase independence	3

Figure 6: Determining Factors for Adaptive Equipment

4. Referring to the adaptive equipment list in the chart on the first page, which items are reimbursable by Medicare/Medicaid?

The answers to the reimbursement question were greatly varied. Figure seven shows the responses and their frequencies. Based on this researchers experience, Medicare will only reimburse or purchase a 3-in-1 commode with at physicians prescription for in home use only. Medicaid is individually state controlled and will vary between respondents. This question was poorly worded. Over one-third of the answers were either blank or the respondent indicated that they did not know the answer. This suggests the training from their institutions may not have adequately explained the reimbursement process.

5. When working with an elderly individual with a disability in need of adaptive equipment, are you more inclined to prescribe a kit or package, based on the ailment, or are you more inclined to prescribe individual parts of those kits? Why?

Adaptive Device	General	Specific answers		Totals
	Answer	Medicare	Medicaid	
Sock Aid	5			5
Reacher	4			4
Shower Chair	5		2	7
Bath Bench	5		2	7
Long Handled Scrub Brush	2			2
Shower Wand	1			1
Grab Bars	1		2	3
3-in-1 Commode	16	2	1	19
Raised Toilet Seat	4		1	5
Safety Frame	1			1
Tub Rail	1		2	3
No Answer	7			7
Did Not Know	5			5
Totals	57	2	10	69

Figure 7: Adaptive Equipment Insurance Reimbursement

The majority of respondents, seventy-three percent, indicated they would recommend individual adaptive devices based on the needs of the patients. These needs stem from physical, cognitive, financial, and/or social deficits. There were subjects who did not offer an explanation as to why they prescribe items over kits. The therapists that prescribe kits, four percent, indicated they use kits because it gives the patient a chance to experiment and find out what is best for them. Twenty-two percent said they would prescribe both individual items and complete kits depending on the needs of the patients. Only one respondent indicated that they neither prescribed kits nor individual parts.

Individual Parts	Both	Kits
Not all pieces were appropriate	Patient needs	Patients can try a variety
Patient could already have equipment	Orthopedic patients gets kits	Trial & error
Items bought at local stores	75 percent got orthopedic kits	
Ordered kits but used individual items	Cost to patient or facility	
No explanation	Insurance coverage	
Patients social support		
Cost effective		
Decreases confusion		
Patient needs		

Figure 8: Prescription Tendencies

DISCUSSION

This study was conducted to gauge the readiness of entry level therapists regarding the prescription of adaptive equipment among the elderly. Overall, the reported confidence rating of prescribing the studied adaptive devices was 4.16 out of five, on the Likert scale. This answer falls between the established standard, described in the survey, of ‘adequate’ and ‘very adequate.’ Results suggesting that, overall, the entry level therapists questioned in this survey feel adequately prepared to prescribe dressing, bathing, and toileting to the geriatric populations. The model of this study was that familiarity, education, and experience all play a contributing factor in the entry-level therapists readiness to prescribe adaptive equipment. However, a statistical regression analysis including all three variables reveals that only experience is the significant predictor of overall confidence. If these studies represent the general, entry level therapist, population then the average new therapist gets the least amount of experience in prescribing equipment for patients’ toileting, then bathing, and lastly dressing activities of daily living. Consequently, creating a priority level for further experience needed to raise the

new therapists' confidence levels. Knowing the different confidence levels of each area help the occupational therapy profession to ascertain where possible weaknesses may exist in the experience process.

In respect to the open ended questions there seems to be three big areas of interesting findings, first is the overwhelming lack of personal follow-up that is not happening with our entry level therapists. Perhaps the new therapist is overwhelmed by the amount of paperwork involved with patient care, or that their caseloads are too high to take an active interest in the effectiveness of their prescriptions. There appears to be a good clinical reasoning process that has developed in determining factors that affect the prescription, based on the answers given to question number two. Second, according to the findings, the academic professors of occupational therapy tend to leave the training of bathing, dressing, and toileting prescriptions up to the clinicians while the student is involved in fieldworks. Third, and lastly, even with the poor wording of the question regarding reimbursement there was a great deal of confusion in the answers. Perhaps there is little time spent in the classroom on what would be reimbursable in the clinical profession.

Limitations of the Study

This study has several limitations. First, the open ended question numbered 12 was worded in a confusing manner. This confusion may have hindered the intended inquiry of the question and needs to be read with caution. Second, there was no established model to test the readiness of an individual so one needed to be contrived. The contrived model, used in this study, may not include all the factors that contribute to the individuals' readiness. Third, 80 percent of the respondents had passed the national examination over six months prior to this study. This length of time away from school

may have diminished the memories of their academic training and confused them with actual learning experience. Lastly, the study included less than point three percent of the total population of entry level occupational therapists, based on one year worth of graduation, and should not be taken to represent the entry level therapy population as a whole.

Implications for Clinical Practice

The author would suggest to the occupational therapy community the need to allow students more hands-on training and practice time with patients in prescribing, teaching, training, and using the adaptive devices studied in this thesis. More confident therapists coming into the vocation of occupational therapy, in terms of correct adaptive equipment prescription experience, might just help cure the plague of misprescriptions that seems to have haunted the profession for a few decades. This simple means of increasing the number of well-fitting devices would significantly decrease the financial burden that is often placed on patients, insurance companies, and family members. The occupational therapy community has an obligation to understand and apply the information available to enhance the appropriate prescription of adaptive equipment and encourage its use among clients.

Implications for Further Research

This researcher believes the occupational therapy community would benefit from a future study that would directly measure the time students get in training of bathing, toileting, and dressing equipment. If this study is accurate, then the only significant predictor of overall prescription confidence is experience. It would then be advantageous to research how long students get in that training at

school. The other area of further study that crept up is the process of recycling old adaptive devices to carry on to other patients or to countries that do not have equipment so abundantly available.

CONCLUSION

Adaptive equipment provides the older patient the opportunity to complete her or his personal activities of daily living more independently. This independence creates a ripple effect. First, a higher independence level could increase the individuals self confidence allowing for a higher quality of life. Secondly, being able to take care of ones own needs decreases the burden placed on others to tend to the patients needs. The prescription of adaptive equipment is often based on the analysis and ongoing evaluation of a patient by an occupational therapist. These adaptive devices help to compensate for physical deficits that may have resulted from a number of different sources. The entry level therapist sharpens her/his clinical observation and reasoning skills in the process of their education and hands on experience. This survey found the confidence level of new therapists to be, overall, just above 'adequate.' It is the suggestion of this researcher that if the readiness levels of new therapists can be consistently increased then perhaps: a) misprescriptions will decrease, b) independent personal care will increase among the geriatric population, improving their quality of life, c) some of the financial burden will be lifted from the individual and society in general, and d) the occupational therapist will enter the profession very adequately prepared to meet the needs of both the client and the profession.

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Appendix A

HUMAN SUBJECTS INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

WESTERN MICHIGAN UNIVERSITY



Human Subjects Institutional Review Board

Date: June 22, 2005

To: Ben Atchison, Principal Investigator
Russell Wood, Student Investigator for thesis

From: Mary Lagerwey, Ph.D., Chair

A handwritten signature in cursive script that reads "Mary Lagerwey".

Re: HSIRB Project Number 05-04-20

This letter will serve as confirmation that your research project entitled "Entry Level Therapists' Perceived Readiness to Prescribe Low-technology Adaptive Equipment to Geriatric Populations" has been **approved** under the **exempt** category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you may **only** conduct this research exactly in the form it was approved. You must seek specific board approval for any changes in this project. You must also seek reapproval if the project extends beyond the termination date noted below. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: June 22, 2006

Appendix B
Study Questionnaire

Demographics

- 1 Age ☐ 18-25 ☐ 26-30 ☐ 31-35 ☐ 36-40 ☐ 40+
- 2 Gender ☐ Male ☐ Female
- 3 Education level ☐ Bachelor ☐ Master ☐ Doctorate
- 4 Area of experience ☐ Geriatric ☐ Pediatric ☐ Acute ☐ Sub-acute ☐ Neonatal ☐ Other
- 5 Currently working in occupational therapy? ☐ Yes ☐ No
If no, please answer question #6
If yes, please skip to question #7
- 6 Have you had previous professional Occupational Therapist experience? ☐ yes ☐ No
Explain if answered yes.
- 7 Did you receive a passing score on the National Board of Certification of Occupational Therapist (NBCOT) examination? ☐ Yes ☐ No
- 8 How long ago did you pass the National Board of Certification of Occupational Therapist (NBCOT) examination?
☐ 0-2 months ☐ 2-4 months ☐ 4-6 months ☐ >6 months

The chart below contains a list of adaptive equipment for bathing, toileting, and dressing. Along the top of the chart is five columns. The first column contains the adaptive equipment device list.

- a) In the column labeled 'Familiarity' please indicate your level of familiarity with each adaptive device on a scale from 1 to 5.
1 = haven't heard of device 2 = heard of device but not used 3 = Familiar with device
4 = Familiar with device & prescribe 1-2 a month 5 = Familiar with device & prescribe 1-2+ a week
- b) In the third column, labeled 'educational rating,' please evaluate the education you received on each item in column one and rate it on the following scale:
1 = no training, 2 = poor training, 3 = fair training, 4 = good training, 5 = exceptional training
- c) In column four please rate your confidence level in prescribing each adaptive device to the elderly population; use the following likert scale:
1 = very inadequate 2 = inadequate 3 = neutral 4 = adequate 5 = very adequate
- d) Have you ever prescribed this device as an occupational therapist? Yes or No

Device	a) Familiarity	b) Educational Rating	c) Confidence	d) Experience
Sock Aide	a	b	c	d
Reacher	e	f	g	h
Shower Chair	i	j	k	l
Bath Bench	m	n	o	p
Long Handled Scrub Brush	q	r	s	t
Shower Wand	u	v	w	x
Grab Bars	y	z	aa	bb
3 in 1 Commode	cc	dd	ee	ff
Raised Toilet Seat	gg	hh	ii	jj
Safety Frame	kk	ll	mm	nn
Tub Rail	oo	pp	qq	rr

9. Describe the follow up procedures taken for your patients concerning their adaptive equipment after discharge?

10. What do you find most important in determining adaptive equipment needs?

11. What differences do you find between what you were taught in your academic program compared with your fieldwork assignments concerning adaptive equipment prescription?

12. Referring to the adaptive equipment list in the chart on the first page, which items are reimbursable by Medicare/Medicaid?

13. When working with an elderly individual with a disability in need of adaptive equipment are you more inclined to prescribe a kit or package, based on the ailment or are you more inclined to prescribe individual parts of those kits? Why?