FACTORS INFLUENCING THE USE OF OUTCOME MEASURES IN PHYSICAL THERAPY PRACTICE

by

FRANCES M. WEDGE

JENNIFER BRASWELL-CHRISTY COMMITTEE CHAIR
CYNTHIA BROWN
KATHLEEN FOLEY
CECELIA GRAHAM
SHARON SHAW

A DISSERTATION

Submitted to the graduate faculty of the University of Alabama at Birmingham, in partial fulfillment of the requirements for the degree of Doctor of Science in Physical Therapy

BIRMINGHAM, ALABAMA

2008
FACTORS INFLUENCING THE USE OF OUTCOME MEASURES IN PHYSICAL THERAPY PRACTICE

FRANCES M. WEDGE

DOCTOR OF SCIENCE IN PHYSICAL THERAPY

ABSTRACT

**Background and Purpose:** Use of outcome measures in physical therapy practice is central to demonstrating the effectiveness of treatment interventions, providing accountability and addressing the quality of physical therapy programs. There is limited discussion on the barriers and facilitators to using outcome measures in physical therapy practice. The purpose of this study therefore was to identify the factors that influence a physical therapist when deciding to use outcome measures in clinical practice.

**Subjects:** Participants were 21 physical therapists, seven each from skilled nursing facilities, out-patient clinics and in-patient rehabilitation facilities.

**Design and Methods:** A grounded theory approach was used for interview and data collection. Common themes were determined from the data and a theory developed to explain the rationale behind physical therapists’ decisions to use or not use outcome measures in the clinical setting.

**Results:** Four themes were identified that were related to concepts of time, knowledge, facility culture and professionalism. During data analysis it emerged that therapists require more information on the many outcome measures that are available and that information needs to be easily accessible within the workplace.

**Conclusions:** Therapists value the information generated by using outcome measures in the clinical setting, but they need information on what measures are available and
psychometric properties. Information must be easily accessible and measures easy to use.

Newer graduates and recent learners have a foundation in the use of outcome measures, but more needs to be done in the work setting and through continuing education to promote increased use and understanding.
DEDICATION

To my family, Henry, Christopher and Emily

and to my mother Margaret Holmes

for their patience and support during my years of education.
ACKNOWLEDGEMENTS

I would like to thank Dr. Jennifer Braswell-Christy, Chair of my Committee for her support and encouragement during this process. I also would like to thank Dr. Cynthia Brown, Dr. Kathleen Foley, Dr. Cecilia Graham and Dr. Sharon Shaw for their participation on my Committee and for the invaluable thought provoking discussions. To you all I give my sincere thanks.

I would also like to thank my colleagues, Sue Menegon PT and Joanne Standish PT for blindly agreeing to critique the data generated from the interviews. Their comments provided fresh insight into the interpretation of the data.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENTS</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td>x</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>METHOD</td>
<td>5</td>
</tr>
<tr>
<td>Design</td>
<td>5</td>
</tr>
<tr>
<td>Participants</td>
<td>5</td>
</tr>
<tr>
<td>Procedure</td>
<td>6</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>7</td>
</tr>
<tr>
<td>RESULTS</td>
<td>9</td>
</tr>
<tr>
<td>Issues Related to Time</td>
<td>9</td>
</tr>
<tr>
<td>Influence of Knowledge</td>
<td>10</td>
</tr>
<tr>
<td>Facility Culture</td>
<td>13</td>
</tr>
<tr>
<td>Perspectives on Professional Responsibilities</td>
<td>14</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>17</td>
</tr>
<tr>
<td>Access to Information</td>
<td>18</td>
</tr>
<tr>
<td>Influence of the Work Environment</td>
<td>19</td>
</tr>
<tr>
<td>Therapist Characteristics</td>
<td>19</td>
</tr>
<tr>
<td>Limitations</td>
<td>20</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>22</td>
</tr>
</tbody>
</table>
REFERENCES ..................................................................................................................23

APPENDIX ........................................................................................................................29
   A: IRB APPROVAL FORM ........................................................................................30
   B: RECRUITMENT LETTER .....................................................................................32
   C: CONSENT FORM ...................................................................................................34
   D: QUESTIONNAIRE .................................................................................................37
   E: TABLES SHOWING FREQUENCY OF USE OF OUTCOME MEASURES .........................40
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participant Characteristics</td>
<td>27</td>
</tr>
</tbody>
</table>

viii
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Theoretical Model of the relationships between the factors that influence a physical therapist’s decision to use an outcome measure in clinical practice</td>
</tr>
</tbody>
</table>

ix
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APTA</td>
<td>American Physical Therapy Association</td>
</tr>
<tr>
<td>DGI</td>
<td>Dynamic Gait Index</td>
</tr>
<tr>
<td>FIM</td>
<td>Functional Independence Measure</td>
</tr>
<tr>
<td>ICF</td>
<td>International Classification of Functioning, Disability and Health</td>
</tr>
<tr>
<td>IP</td>
<td>in-patient rehabilitation</td>
</tr>
<tr>
<td>MAS</td>
<td>Modified Ashworth Scale</td>
</tr>
<tr>
<td>OP</td>
<td>out-patient clinic</td>
</tr>
<tr>
<td>PT</td>
<td>physical therapy</td>
</tr>
<tr>
<td>ROM</td>
<td>range of motion</td>
</tr>
<tr>
<td>SF 36</td>
<td>Medical Outcomes Study 36 Item Short Form Health Survey</td>
</tr>
<tr>
<td>SNF</td>
<td>skilled nursing facility</td>
</tr>
<tr>
<td>VAS</td>
<td>visual analogue scale</td>
</tr>
</tbody>
</table>
Current emphasis on evidence based practice in physical therapy has increased the demand for therapists to use reliable and valid outcome tools. Although use of outcome measures has been encouraged for many years, they are not used consistently by physical therapists in clinical practice. Outcome measures are defined as measurement tools that exhibit responsiveness or ability to measure clinically important change over time. Outcome measures are used in research, for program evaluation, quality improvement, case management, utilization review and cost containment. In physical therapy practice, outcome measures are used to document change in patient status following administration of physical therapy (PT) interventions, providing evidence to support treatment effectiveness. Outcome measures should be standardized, have detailed instructions for administration, scoring and interpretation of results and meet accepted criteria for reliability and validity.

Valid and reliable outcome measurement tools have been developed to address all levels of the International Classification of Functioning, Disability and Health (ICF) (i.e. body function and structure, activities, participation) and to measure such constructs as health-related quality of life. Measures of body function and structure include impairments e.g. range of motion and muscle strength. Functional outcomes address activities and participation e.g. Functional Independence Measure. Quality of Life measures include instruments such as the Medical Outcomes Study 36 Item Short Form Health Sur-
Outcome measures are frequently developed for specific populations such as Parkinson’s disease or osteoarthritis. Therefore, it is important that physical therapists select outcome measures appropriate for a specific population and construct of interest. Reliability and validity of an instrument might be diminished if used in a population for which it has not been formally tested. There are often several tools available for each construct, thus the therapist must know not only what measures are available for a specific construct, but also the significance of the scores for a specific patient population. Knowledge of available outcome measures and an understanding of the psychometric properties of a particular instrument are important if therapists are to include outcome measures in clinical decisions. Although researchers use outcome measures routinely to test the effectiveness of interventions, the literature suggests that clinicians might be less comfortable with the use of many of these instruments in the clinical setting.

Little is known about factors influencing a physical therapist’s decision to use an outcome measure in clinical practice. A 1992 Canadian study reported the majority of respondents were uncomfortable with the use of outcome measures. Only 20% of surveyed therapists reported using at least one published outcome measure. A follow-up study in 1998 found that 97% of therapists used at least one outcome measure from a provided list of 22 named instruments. The authors concluded that, in the years between studies, Canadian physical therapists had become more familiar with outcome measures, but some still did not use them systematically as part of the clinical decision making process. Increased familiarity with outcome measures led to increased usage, but impediments to universal adoption of these measures in clinical practice remained.
In the latter studies therapists from five academically affiliated institutions were surveyed about their confidence in choosing and using outcome measures.\textsuperscript{11,12} Subjects were relatively confident administering and scoring outcome measures, but lacked confidence choosing the best measure for a particular patient population and using information generated by the measure.\textsuperscript{11,12} Although these studies provide insight into therapists’ decision making, the therapists worked in facilities with strong academic connections that might have led to greater exposure to information on outcome measures.\textsuperscript{11,12}

Limited knowledge of outcome measures that are available may lead to difficulty choosing the best measure for a patient. To manage this issue, some organizations mandate use of particular outcome measures. However, therapists have indicated that they prefer to have the option to choose which instruments they use rather than have a specific measure imposed on them.\textsuperscript{12} Mandated use of a specific measure is often required in benchmarking situations where one facility compares its outcomes with those of similar facilities. Harland et al.\textsuperscript{13} studied the feasibility of using questionnaire based outcome measures across sites in northern England with the goal of comparing outcomes between facilities. Three measures were chosen and distributed to the facilities, but clinicians did not complete the measures appropriately. Investigators concluded that poor compliance was due to failure of clinical staff to fully accept the project and inadequate training on the use and purpose of outcome measures.\textsuperscript{13}

There is some evidence to provide insight into the use of outcome measures in clinical practice in Canada, Europe and Australia\textsuperscript{8,9,11-13} however, there appears to be no similar study addressing physical therapists’ experiences selecting and using outcome measures in America. Physical therapists educated in America receive more years of en-
try-level education than is typical for other countries. Limited evidence suggests that therapists with higher degrees and/or who graduated more recently are more familiar with the use of outcome measures. However, it is not known whether highest degree achieved or clinical specialist designation has an influence on a physical therapist’s use of outcome measures. Although the literature suggests that therapists working in inpatient settings encounter more difficulties using outcome measures than their counterparts in out-patient clinics, it is not known how practice setting impacts use of outcome measures.

It is evident that many outcome measures are not being used in everyday practice. Jette and Haley argued that many instruments presently available are not feasible for use in a busy clinical setting and that more user-friendly tools need to be developed. Considerable effort has been put into establishing psychometric properties of outcome measures, but there is limited research exploring clinician perspectives on ease of use of these instruments. A tool that is not user friendly may get very little use regardless of its scientific credibility. There is limited discussion on factors influencing physical therapists’ decisions to use outcome measures in clinical practice in America. The purposes of this study, therefore, were to identify the factors that influence the use of outcome measures in PT practice and to develop a theory to explain the rationale behind physical therapists’ decisions to use or not use outcome measures in the clinical setting.
METHOD

Design

A qualitative design was chosen for this study to gain insight into individuals’ experiences and feelings about use of outcome measures. A qualitative study explores, in depth, the subjects’ point of view, something that cannot be done with quantitative data. Grounded theory, a form of naturalistic inquiry, was used for data analysis to generate a theory reflecting practice. A literature review was undertaken to determine what research exists in this area and to provide a guide for initial interview questions. However, this initial review was not extensive to avoid undue researcher bias. Consistent with grounded theory practice, a more in depth literature review was conducted following data collection and analysis, comparing and contrasting existing literature with emerging theory.

Participants

To examine the effect of practice setting on use of outcome measures, a purposive sampling approach was used to select participants who worked in one of three settings: in-patient rehabilitation (IP), out-patient clinic (OP) and skilled nursing facility (SNF). Participants were recruited through convenience sampling on a volunteer basis. Licensed physical therapists working in one of the targeted settings within Chicago and surrounding counties were eligible for inclusion. Subjects were recruited through direct mailings
to facilities, an invitation through the Illinois Physical Therapy Association list serve and through word of mouth. To limit bias through self-selection, prospective participants were not initially informed that the research focused on use of outcome measures, rather that the study addressed practice patterns in PT. Recruitment was ongoing and ended when saturation, the point when no new information emerged, was reached.

Twenty-one participants were ultimately recruited, seven from each practice setting. Sixteen participants were female, five were male. Years of experience in PT ranged from nine months to 31 years (mean 12, SD +/-8). Age ranged from 25 years to 54 years (mean 37, SD +/-8). Participants represented a mix of newer graduates, those graduating from entry level education within the past five years, recent learners, therapists who completed a post professional degree within the past ten years and more experienced therapists. Only one participant was a board certified clinical specialist (Table 1). Informed consent and all study protocols were approved by the institutional review board of the University of Alabama at Birmingham.

**Procedure**

Participants received a questionnaire to be completed prior to the interview. The questionnaire was used to collect information to determine if therapist characteristics had any influence on use of outcome measures. The questionnaire also included a checklist for therapists to identify outcome measures used in their practice. These responses were used to help guide interview questions.

The primary source of data was through individual, face to face interviews. A semi-structured interview guide was used to encourage participants to provide detailed
information about their beliefs on use of outcome measures in their practice. Using an open-ended question format, participants were asked to identify what they understood by the term outcome measure. Subsequent questions focused on therapists’ use of outcome measures, how they had learned about the instruments, factors influencing decisions to use outcome measures and the value they placed on the use of outcome measures. The closing question gave the participant the chance to provide additional information.

Each interview was audio taped and transcribed by a professional transcriptionist. Using an iterative approach, analysis began after the first interview with emerging themes explored in subsequent interviews. Consistent with grounded theory a constant comparative approach of comparing new data with existing data was used to guide the direction of subsequent interviews and to identify emerging themes.\textsuperscript{15,16} To ensure confidentiality, participants were assigned a code reflecting only practice setting (IP, OP, SNF) and order in which they volunteered for the study.

Data Analysis

Coding or labeling of ideas and concepts was initiated as each transcript was reviewed.\textsuperscript{15,16} This initial coding led to the identification of several categories which were refined, expanded and reevaluated with each successive review of data. Four main themes were eventually developed with each containing several subthemes that served to further explain the main construct.

Three tools common to qualitative research were used to enhance credibility of the findings. Triangulation is the process of comparing data from different sources.\textsuperscript{16} In this study, responses from participants in each of the three practice settings were com-
pared for similarities and to confirm emerging categories. Member checking, seeking participants’ confirmation of data, \(^\text{15}\) required that each participant was sent, via e-mail, a synopsis of the findings from the data. Participants were asked to review the material and confirm that their views on the use of outcome measures had been represented. They were invited to make additional comments. Peer review, used to establish dependability, \(^\text{15}\) required that two colleagues who had not been part of the investigation review randomly selected transcripts from each of the three settings and comment on the coding and emerging findings.
RESULTS

Four major themes that described participants’ decisions to use outcome measures in clinical practice emerged from the interviews.

Issues Related to Time

Several subthemes emerged that addressed therapist concerns over time. Time to actually carry out the assessment was a concern in all settings, but participants agreed that if they felt that an outcome measure was indicated they would find time to complete it. This did not always mean that it would be done at the first patient encounter as there were frequently many distracters.

I probably wouldn’t do the Berg balance scale on the initial exam just because our eval right now is three pages long. So that would be something I might do on the second or third day, because there are so many other things to test and document (SNF4).

Paperwork is not the only distracter. SNF and in-patient settings both present with problems that revolve around patient needs, thus reducing time available to execute the outcome measure. “That patient had a bowel movement, or they needed medication, or the doctors came in and out… Making excuses, but yes, that's the reality of it” (IP1).

Even with all of these incursions into time with a patient during the initial encounter, participants reported finding time to get an outcome measure completed by prioritizing tasks and deferring some aspects of assessment until second or third visits. This is often easier for in-patient therapists who see patients twice a day. Participants working in
out-patient settings also identified the need to organize their time, prioritizing what needs to be done. This may mean giving the patient a self report measure to complete at home. “…if it’s a self-assessment test for the patient, we try to give them as much time as they need to fill it out. If it’s a long one then we’ll have them take it home and bring it back” (OP4).

Ease of use emerged as an issue related to time. Participants in all settings reported choosing measures that are quick and easy to perform and require little in the way of equipment. “With the gait speed, I know I’ve got two lines on the floor that I know are 30 feet so while walking and working on endurance I can easily calculate that….. That’s really nice because it’s easy, so it’s really all about the ease of use” (IP3).

A third subtheme, time to search for suitable outcome measures at work, was an issue in all settings. Lead therapists may be allocated time to investigate outcome measures for program development, but this is not always sufficient. “I did get a little bit of program development time for the Parkinson's program ….. It was not a significant amount of time” (IP3). Productivity requirements impact time at work for literature searches, which means that therapists who seek more information will do research at home. However, many participants reported a need to balance work and home life.

Influence of Knowledge

A marked difference in knowledge of outcome measures was found between new graduates / recent learners, irrespective of highest degree earned, and those therapists who had not had any recent academic exposure. For new graduates/recent learners there
was evidence to show that academic programs are stressing the need to use outcome measures as an objective way to measure PT interventions.

It is a little more prominent in post grad, they did recommend a lot of outcome measures. We want to show that we are not just saying that the patients are getting better. We want to show it through a valid and approved way of doing it (OP7).

However, some new graduates wished that more emphasis had been placed on the mechanics of performing outcome measures in the classroom as opportunities to practice on clinical affiliations were not always available.

Sometimes it was not emphasized enough at school. So you might have reviewed it (Berg Balance scale)… We never really incorporated it much into actual patients or doing it enough. Some of these things are very repetitive you have to do it over and over again until you get comfortable. I travelled for my placements, in general I would have to say that the therapists that I worked with did not do a lot of that, it was more based on impairments and the things that you saw (OP2).

Participants indicated that they learn about outcome measures by reading the literature, attending continuing education courses or learning from colleagues either in the form of observation and conversation or more formally through in-services. Although continuing education courses were identified as a source for learning about outcome measures, not all courses provide this type of information. “I just attended a seminar on hip and knee last week, but nobody mentioned these tools. They mentioned the surgical procedures and the protocols for hip and knee” (SNF6). Many participants admitted that they do not necessarily search the literature or choose courses that would provide them with information on outcome measures preferring information on treatment strategies. If an article or course mentions an outcome measure and the therapist is motivated then they will do further research.

While new graduates also learn from colleagues they find lack of knowledge in more experienced therapists can be a barrier to learning. “So it is kind of frustrating as a
new grad trying to look for information from clinicians who have been out for a while
and they don’t really know much about it or they don’t have a good understanding …”
(OP2).

Most participants reported some understanding of requirements for reliability and
validity in a measure, but do not necessarily investigate the psychometric properties of
measures that they use. Several participants expressed concern over lack of knowledge of
patient suitability for a particular measure.

I think of some patients who have balance deficits and I would love to do a Berg
but I know they would score so low that it isn’t even sensitive enough to capture
that at that low level or if they have blindness, like I had one with a hemianopsia.
Is it still applicable? Well it should be because they walk, but I still always ques-
tion, is it accurate to use a Berg with an individual who has this? (OP1)

Participants indicated that they would like to have information on outcome measures,
their psychometric properties and perhaps templates, all in one place as several reported
not knowing where to find this information.

Even participants who use measures routinely sometimes have questions about in-
terpreting the results. This is a particular concern for therapists who may use a measure to
assess fall risk. “I do not feel comfortable saying this test tells me you are okay now. You
could have something happen …, something that never happened when I was with you”
(OP3). Others believe this situation can be overcome by using more than one outcome
measure. “I just feel that one test doesn’t really give you the whole clinical picture. If you
want the whole clinical picture I think doing more than one test will show what the other
test did not show” (SNF5).

Knowledge also includes familiarity with using a measure. Many therapists re-
ported that the more they used a measure the more comfortable they became with it and
the more consistently they used it, often to the exclusion of suitable alternatives. This concept of familiarity through use is consistent across settings. “When I first started doing this, the Berg, it was little bit harder and now I find it easy. … That’s why I don’t use the Tinetti, because I’m not familiar with it, or the DGI, which are some of the other sound ones” (IP3).

Patient suitability emerged as a final step in deciding whether or not to use an outcome measure with a patient. This decision, frequently based on the patient’s functional status, is consistent across settings. Although the functional level of a patient has some bearing on this decision, a therapist’s knowledge of what is available for different populations may also be a factor as some participants reported not being able to find suitable measures for their patient population.

Facility Culture

Culture and organization within a facility both influence a therapist’s decision to use an outcome measure. The only setting in which use of an outcome measure was mandated was the in-patient rehabilitation setting, where therapists were required to use the Functional Independence Measure (FIM). Participants accepted the FIM as a necessity without questioning, but reported frequent use of other outcome measures in order to capture the subtle detail they were seeking when assessing a patient. In other settings use of specific outcome measures is encouraged, but not mandated.

Outside of the manual muscle testing, range of motion, and pain, not necessarily required, however if we have a neuro day rehab patient, then it is strongly encouraged and recommended that we do the Berg, the Tinetti, Get-Up-and-Go, and 6-minute walk test. With the general out-patient population, not as much, I try to just because I think it helps the evaluation process and outlines the treatment process (OP4).
While some participants see mandated use as a way to get more people using measures, others argued that this should be an individual decision. In facilities where use of outcome measures is encouraged there appears to be strong administrative support and allocation of time or search facilities for investigating appropriate tools. “I think it initially came about with (PT manager) wanting to get more objective evidence-based practice measurements” (OP4). Key players at each facility will then train others in the use of specific outcome measures. Learning about outcome measures from colleagues either through formal in-services or through observation is seen as a positive factor. However, some of the respondents felt that complacency can be an issue with colleagues. “You do get therapists that get stuck in a rut, and don’t read the literature and don’t look for new approaches to patient care” (OP5).

Facilities that promote the use of outcome measures often have a space for reporting findings on evaluation forms or have forms, pre-printed with the outcome measure, readily available. In facilities where this happens, participants reported that it served as a trigger. “It is all there on the eval - timed minute walk, single leg stance. Because it’s written on the eval it’s actually easier” (IP5).

Perspectives on Professional Responsibilities

Participants appear to use outcome measures to augment practice. They are used as tools to aide in clinical decision making, to provide objective data to justify treatment and show effectiveness of a program of physical therapy. Participants in all settings report that data generated from an outcome measure frequently helps them plan treatment interventions. “If I’m not sure if the patient can use a walker or cane, or just use a wheel-
chair, if I’m not sure, then I use the Berg since the Berg shows me what they can do” (SNF2).

In some instances using an outcome measure identifies problems that may not be immediately apparent during the routine evaluation. “The older population, more geriatrics … it might give you an indication that something else is going on and you think oh I wouldn’t have thought to have looked at that before, but now I really need to” (OP2).

Participants reported repeating outcome measures to determine progress and show whether or not the treatment plan has been effective. Lack of improvement in scores triggers the therapist to examine current interventions and revise the treatment plan. The fact that the outcome measure provided objective data was important for many participants. “I want to use outcome measures more now because it’s an objective measure. You can actually document this is what they did and you can look back and it’s like wow, they were only four here and now they are here” (IP2).

Many respondents felt that outcome measures were important to justify to insurance companies and other third parties that we provide effective and efficient treatment strategies. “Just the fact that we need to be more accountable for what we are doing and the treatment approach that we have this is going to reinforce what we are telling people” (OP7).

Data generated by outcome measures are frequently used to communicate patient ability. Participants typically do not report raw scores; instead they will interpret the findings reporting the meaning of results. “What we primarily tell them is this person should not be up and about in their room alone” (SNF1). Participants who job share use standar-
dized tools to facilitate communication with each other. Data from the outcome measure is also interpreted for patients and family members, especially when safety is an issue...

I use it, primarily, I would say for educating the patient. By saying look at this, when you’re trying do all of these things, your overall score is a 42; you are going to be at risk for fall. … This is why we have you use a walker because when you are trying these things without it (you are at risk for falling) (IP3).

The use of outcome measures was seen as having a positive role in promoting the value of the profession. Many participants reported the value in using outcome measures for research and to support the growth of our professional body of knowledge. The perceived value of using outcome measures to support autonomous practice varied between participants in different settings. Some felt that use of this type of tool would be more important in the out-patient setting, where direct access would have more of an impact. Although some participants felt that using outcome measures would not have any impact on autonomous practice, others felt that universal use of outcome measures in any setting would only further serve to enhance our professional image.

Based on themes from this study a theoretical model was developed showing a clear interaction between time, knowledge and facility culture with a central concept, availability or accessibility of information, linking all three. Time, knowledge, and facility culture are encompassed by a fourth theme, that of professionalism. (Figure 1) Professionalism identifies the value that the physical therapist places on use of outcome measures, both in individual practice and as behavior promoting the profession as a whole.
DISCUSSION

The primary purpose of this study was to identify factors influencing the use of outcome measures in PT practice in America. Three areas of interest were explored: factors influencing a physical therapist’s decision to use outcome measures, influence of practice setting and therapist characteristics. Regardless of therapist characteristics and practice setting, respondents use outcome measures to augment professional responsibilities, both on an individual level and to promote the image of the profession.

Constructs related to the overarching theme of professionalism: accountability, communication, professional responsibility to provide the best care to a patient, and use of evidence in practice to support clinical decisions, were mentioned by the majority of participants as key reasons for using outcome measures. These constructs are central to the core values on professionalism advocated by the American Physical Therapy Association (APTA) and which serve to support the Vision 2020 Statement. They are also consistent with behaviors identified as generic abilities that are important to the profession of physical therapy. Participants value information generated by using outcome measures to guide clinical decision making, consistently reporting that outcome measures provided them with evidence, supplanting subjective opinion. Clinical benefits to using outcome measures reported in this study are consistent with other studies and reinforce the belief that outcome measures not only support professional practice, but also are used to demonstrate effectiveness of PT interventions.
Access to Information

Consistent with other research,\textsuperscript{11,12} limited knowledge of what is available emerged as a barrier to using outcome measures. Hammond\textsuperscript{2} believed that therapists would be deterred from using outcome measures because the work involved in searching for relevant measures would be too time consuming. This argument was supported by comments made by respondents in this study, including those who are more familiar with computer based search techniques. Participants wanted information that was easily accessible and, in line with findings from other studies,\textsuperscript{21} wanted information all in one place. In the current study few participants were aware of published texts that already provide this information and those that were noted research and development of outcome measures often outpaces information available in such textbooks. APTA members applauded efforts by the association to provide therapists with evidence based sites such as Open Door and Hooked on Evidence, but felt that a site dedicated to current outcome measures, detailing psychometric properties and suitable populations would facilitate greater use of a wider variety of measures in practice. Limited knowledge of what is available will cause therapists to either stay with measures with which they are familiar or result in the belief that an appropriate outcome measure does not exist. For participants with no recent exposure to formal education, lack of search skills was a barrier to finding suitable measures. These participants relied heavily on continuing education courses and peers to learn about outcome measures, avenues which may not always provide required information. Lack of skill in finding suitable measures and lack of information have been cited by others as barriers to implementation of new interventions.\textsuperscript{22,23}
Influence of the Work Environment

Many participants mentioned lack of time and facilities at work to conduct searches for outcome measures. These findings are consistent with other studies, where limited computer availability and lack of protected search time were identified as barriers to evidence based practice. However, examples were given by respondents where administration strongly supported clinicians’ use of outcome measures. The organizational environment can be a barrier or facilitator to implementation of evidence based practice. Participants were more likely to use a wider variety of outcome measures in settings where administration provided time and materials to facilitate integration of these measures into routine practice. Learning to use an outcome measure takes time initially, something that therapists and managers need to consider. However, consistent with other research, participants in this study reported that with frequent use outcome measures are easily integrated into routine care. Therapists are also influenced by the actions of the people with whom they work. Social interaction within the work place plays a role in learning and acquiring knowledge. Although this can be either a positive or negative experience, it has the potential to be an important facet of knowledge acquisition by both newer graduates and more experienced therapists. Colleagues and a supportive facility culture can be catalysts for change, influencing therapists in their choice and use of outcome measures.

Therapist Characteristics

In this study recent learners and newer graduates, regardless of degree, were observed to be more animated in their discussion of values placed on using outcome meas-
ures and were more comfortable searching the literature for information than experienced therapists. These findings are supported by other researchers²⁴,²⁹-³¹ who report that clinicians with higher degrees or recent formal learning experience are more likely to integrate evidence into practice. Recent learners and newer graduates have the advantage of more formal education in the use of outcome measures than experienced therapists. This may be because of the greater number of outcome measures that have entered the market in recent years and increased emphasis placed on integrating evidence into practice.³¹

Almost all respondents indicated that they rarely sought out articles or continuing education courses specifically addressing outcome measure use, preferring instead articles and courses providing information on interventions. However, participants wanted discussion on appropriate outcome measures included as routine in the literature and on courses. While APTA members have access to Physical Therapy, non-members are clearly at a disadvantage, relying solely on non-peer reviewed journals for information. Motivated therapists seek out measures discussed in articles by searching online, but again time and search skills can be limiting factors.

Limitations

As with any qualitative study, the extent to which these findings can be generalized to a wider population is limited. Therapists were chosen from a specific geographic area as a matter of convenience. Attempts were made to minimize the bias of self selection by not indicating the true purpose of the study in initial recruitment material. Therapists were given the chance to withdraw when notified that the topic under investigation was the use of outcome measures, but none chose to do so. There is concern that
investigator bias may have influenced the results, but member checking was used to confirm that subject’s views were faithfully represented. Peer review was also used to reduce the chance that investigator bias influenced the development of themes.
CONCLUSION

Several factors have been identified that influence a physical therapist’s decision to use outcome measures. Physical therapists value information generated by using outcome measures primarily as a tool to aide clinical practice, but also as a means to support professionalism within physical therapy. Time is not generally viewed as a deterrent to use, but therapists use instruments with which they are familiar, require little in the way of equipment and which are easy to use, choosing measures that are not time consuming. Lack of easily available information on outcome measures is a factor limiting use. While newer graduates and recent learners appear to have a more solid base of knowledge about outcome measures more needs to be done to educate the experienced therapist. Future research examining the transferability of these theories to other clinical settings and geographic locations should be considered.

As the use of outcome measures appears to be facilitated by administrative support and peer use, future studies should also examine aspects of facility culture in more depth, identifying characteristics of settings that are successful at integrating frequent use of outcome measures into practice. Exploring these issues will help identify models of practice that support increased use of outcome measures in the clinic.
REFERENCES


3) Bohannon RW. Objective measures *Phys Ther* 1989; 69:590-593


10) Wedge F. An investigation into how a group of physical therapists assess and monitor elderly homebound clients who present with balance and mobility problems and / or are at risk for falls. 2002 MSc dissertation housed at the University of Greenwich London, England.


15) DePoy E, Gitlin LN. *Introduction to Research: Understanding and Applying Multiple Strategies*  St Louis, MO: Elsevier Mosby; 2005


17) American Physical Therapy Association Professionalism in Physical Therapy: Core Values located at [www.apta.org](http://www.apta.org) accessed 2/01/08

18) American Physical Therapy Association Vision 2020 located at [www.apta.org](http://www.apta.org) accessed 2/01/08

20) Jette DU, Portney LG. Construct validation of a model of professional behavior in physical therapist students. *Phys Ther* 2003;83:432-443


27) Richardson B. Professional development: 1. Professional socialization and professionalization *Physiotherapy* 1999;85(9):461-467
28) Richardson B. Professional development: 2. Professional knowledge and situated learning in the workplace Physiotherapy 1999;85(9):467-474

29) Barnard s, Wiles R Evidence based physiotherapy: Physiotherapist’s attitudes and experiences in the Wessex area. Physiotherapy 2001;87(3):115-124


Table 1: Participant Characteristics

<table>
<thead>
<tr>
<th>Age</th>
<th>All Participants N=21</th>
<th>Out-Patient n=7</th>
<th>In-Patient n=7</th>
<th>SNF n=7</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>12</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>41-50</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>51-60</td>
<td>2</td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>All Participants</th>
<th>Out-Patient n=7</th>
<th>In-Patient n=7</th>
<th>SNF n=7</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>16</td>
<td>6</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>M</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years since entry level graduation</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>11-15</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>16-20</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>21-25</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-30</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>30+</td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entry level degree</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diploma</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS</td>
<td>13</td>
<td>2</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>MSPT</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>MPT</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>DPT</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest earned post professional degree</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>tDPT</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years since graduation with highest earned post professional degree</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-5</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11-15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-25</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APTA Membership</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>10</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>11</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Specialist (ABPTS)</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical Educator</th>
<th>All Participants</th>
<th>Out-Patient</th>
<th>In-Patient</th>
<th>SNF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>13</td>
<td>5</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>
Figure 1: Theoretical Model of the relationships between the factors that influence a physical therapist’s decision to use an outcome measure in clinical practice
Form 4: IRB Approval Form
Identification and Certification of Research
Projects Involving Human Subjects

UAB's Institutional Review Boards for Human Use (IRBs) have an approved Federalwide Assurance with the Office for Human Research Protections (OHRP). The UAB IRBs are also in compliance with 21 CFR Parts 50 and 56 and ICH GCP Guidelines. The Assurance became effective on November 24, 2003 and expires on February 14, 2009. The Assurance number is FWA00005960.

Principal Investigator: WEDGE, FRANCES M
Co-Investigator(s): X070712009
Protocol Number: Factors Influencing the Use of Outcome Measures in Physical Therapy Practice

The IRB reviewed and approved the above named project on 07/31/07. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services. This Project will be subject to Annual continuing review as provided in that Assurance.

This project received EXPEDITED review.
IRB Approval Date: 7-31-07
Date IRB Approval Issued: 07/31/07

Marilyn Doss, M.A.
Vice Chair of the Institutional Review Board for Human Use (IRB)

Investigators please note:

The IRB approved consent form used in the study must contain the IRB approval date and expiration date.

IRB approval is given for one year unless otherwise noted. For projects subject to annual review research activities may not continue past the one year anniversary of the IRB approval date.

Any modifications in the study methodology, protocol and/or consent form must be submitted for review and approval to the IRB prior to implementation.

Adverse Events and/or unanticipated risks to subjects or others at UAB or other participating institutions must be reported promptly to the IRB.

470 Administration Building
701 20th Street South
205.934.3789
Fax 205.934.1301
irb@uab.edu

The University of Alabama at Birmingham
Mailing Address:
AB 470
1530 3RD AVE S
BIRMINGHAM AL 35294-0104
Dear (director name)

I am requesting your assistance in finding physical therapists interested in participating in a study to examine the practice patterns of physical therapists in the clinical environment. I am seeking subjects who work in outpatient physical therapy, inpatient rehab or skilled nursing facility settings. This is a qualitative study and I will be gathering data through face to face interviews. It is expected that the results of this study will provide insight into the decision-making processes used by physical therapists in the context of patient evaluation and treatment planning.

I would be grateful if you could share this information with your staff. I have included a flyer that you may choose to post on your notice board, if that is more convenient. I plan to meet with volunteers for the interview at a time and place that is mutually acceptable. Each volunteer will receive $10.00 for participating in this study. This will be paid at the time of the interview.

Therapists who are interested in participating in this study can contact me at (815) 715-1923 or at fmwedge@sbcglobal.net. Interested staff could contact me by ?.

Many thanks for your time.
Regards

Fran Wedge PT, MSc, GCS
DScPT student
University of Alabama at Birmingham.
Consent to Participate in a Research Study

Title of Research: Factors Influencing the Use of Outcome Measures in Physical Therapy Practice

Investigator: Fran Wedge PT, MSc, GCS.

Sponsor: None

Explanation of Procedures
You are invited to participate in a research project being conducted by Fran Wedge PT, MSc, GCS, graduate student in the Department of Physical Therapy at the University of Alabama at Birmingham. The purpose of this research is to study the use of outcome measures by physical therapists in clinical practice.

If you decide to participate, you will be asked to complete a brief questionnaire and participate in a face to face interview in order to gain insight into your use of outcome measures. This session will be recorded on audiotape to allow for data analysis. The audio tape will be destroyed once data analysis and verification are complete. The process should last no longer than one hour. You may be contacted, at a later date to verify that the primary researcher has correctly interpreted the information given during this interview. Please enter your contact information below. A maximum of 30 participants are to be enrolled in this study.

Risks
Except for your time and inconvenience, there are no foreseeable risks to you in participating in this study.

Benefits
You may receive no direct benefit from participating in this research. However, this study will help in understanding the factors involved in the decisions to use or not use outcome measures in clinical practice. This knowledge will help not only developers of future outcome measures, but will also help direct the training of staff and education of students to better prepare clinicians to use outcome measures in clinical settings.

Alternatives
The alternative is not to participate in this research.

Confidentiality
Your name will not be on any documents. A coded number will be used to protect your identity. The key linking your name to the data will be destroyed once data analysis and verification are complete. The University of Alabama at Birmingham (UAB) Institutional Review Board may review the research records for auditing purposes.

Refusal or Withdrawal
Your participation in this study is voluntary. You have the right to withdraw at any time.
Cost of Participation
There will be no cost to you from taking part in this study other than your travel to the site of the interview.

Payment for Participation in Research
You will be paid $10.00 for your participation in this study. You will be paid at the time of the interview.

Questions
If you have questions about this research, please contact Fran Wedge at (815) 715-1923 or fmwedge@sbcglobal.net.

If you have questions about your rights as a research participant, or concerns or complaints about the research, you may contact Ms. Sheila Moore. Ms. Moore is the Director of the UAB Office of the Institutional Review Board for Human Use (OIRB). Ms. Moore may be reached at (205) 934-3789 or 1-800-822-8816. If calling the toll-free number, press the option for “all other calls” or for an operator/attendant and ask for extension 4-3789. Regular hours for the Office of the IRB are 8:00 a.m. to 5:00 p.m. CT, Monday through Friday. You may also call this number in the event the research staff cannot be reached or you wish to talk to someone else.

Legal Rights
You are not waiving any of your legal rights by signing this informed consent document.

Signatures
Your signature below indicates that you have read and discussed the above information and that you consent to participate in this study. You will receive a signed copy of this form for your records.

__________________________________________ Date
Participant’s signature

__________________________________________ Date
Researcher’s signature

To verify interpretation of interview information please provide an email address where you can be reached:
__________________________________________
Questionnaire: General demographics and outcome measure use.

1) Age in years:____________________

2) Gender:   M  F   (circle choice)

3) Years since graduation from an entry level PT program:____________________

4) Entry level degree: (circle choice)
   Diploma    BA    BS    MSPT    DPT    Other:____________________

5) Highest earned degree: (circle choice)
   Diploma    BA    BS    MS    MA    DPT    DSc    Ph.D.    Other:____________________
   Year of graduation (highest earned degree):____________________

6) APTA membership:        Yes       No    (circle choice)

7) Clinical specialist: (indicate type(s) of specialist certification)

8) Primary practice setting: (circle choice)
   In-patient rehab  outpatient  SNF

9) Approximately what percentage of your patients are covered by:
   Medicare _____________   Medicaid _____________   Self-pay _____________
   Private Insurance / Workers Compensation _____________

10) Approximately what percentage of your patients are:
   Musculoskeletal_________ Neurological___________   Cardiopulmonary_______
   Integumentary_____

11) Are you involved in student clinical education? Yes       No    (circle choice)
12) For the two weeks leading up to our meeting assess how often you use outcome measures in your work. Indicate which outcome measures you use and frequency of use:

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Never 0%</th>
<th>Rarely Less than 25% of the time</th>
<th>Occasionally 26%-50%</th>
<th>Frequently 51%-75%</th>
<th>Almost Always More than 75% of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAS for pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barthel Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF-36</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tinetti gait and balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional reach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gait speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E

TABLES SHOWING FREQUENCY OF USE OF OUTCOME MEASURES
Table 1: Frequency of use of selected outcome measures: all participants

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Never (0%)</th>
<th>Rarely (Less than 25% of the time)</th>
<th>Occasionally (26%-50%)</th>
<th>Frequently (51%-75%)</th>
<th>Almost Always (More than 75% of the time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>ROM</td>
<td>2</td>
<td>4</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAS for pain</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIM</td>
<td>12</td>
<td>1</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barthel Index</td>
<td>19</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SF-36</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Timetti gait and balance</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>10</td>
<td>6</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>20</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td>12</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td>10</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Functional reach</td>
<td>8</td>
<td>6</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gait speed</td>
<td>13</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td>17</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td>18</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other: Modified Ashworth Scale (MAS), Dynamic Gait Index (DGI), Shoulder Pain and Disability Index (SPADI), Western Ontario McMaster Osteoarthritis Scale (WOMAC)
Table 2: Frequency of use of selected outcome measures: outpatient participants

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Never (0%)</th>
<th>Rarely Less than 25% of the time</th>
<th>Occasionally 26%-50%</th>
<th>Frequently 51%-75%</th>
<th>Almost Always More than 75% of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td>1</td>
<td>2</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>ROM</td>
<td></td>
<td>1</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>VAS for pain</td>
<td></td>
<td>1</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIM</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barthel Index</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF-36</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tinetti gait and balance</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td>5</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Functional reach</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Gait speed</td>
<td>5</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td>4</td>
<td>1</td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DGI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>SPADI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>WOMAC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Other: Dynamic Gait Index (DGI), Shoulder Pain and Disability Index (SPADI), Western Ontario McMaster Osteoarthritis Scale (WOMAC)
<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Never (0%)</th>
<th>Rarely Less than 25% of the time</th>
<th>Occasionally 26%-50%</th>
<th>Frequently 51%-75%</th>
<th>Almost Always More than 75% of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td>1</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROM</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAS for pain</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FIM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Barthel Index</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SF-36</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tinetti gait and balance</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td>3</td>
<td></td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional reach</td>
<td></td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gait speed</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Frequency of use of selected outcome measures: SNF participants

<table>
<thead>
<tr>
<th>Manual Muscle testing</th>
<th>Never</th>
<th>Rarely Less than 25% of the time</th>
<th>Occasionally 26%-50%</th>
<th>Frequently 51%-75%</th>
<th>Almost Always More than 75% of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ROM</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>VAS for pain</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>FIM</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Barthel Index</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>SF-36</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tinetti gait and balance</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Functional reach</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Gait speed</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Other: MAS</td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Other: Modified Ashworth Scale (MAS)
<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>All Settings</th>
<th>Out-Patient Setting</th>
<th>In-Patient Rehab Facilities</th>
<th>Skilled Nursing Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Muscle testing</td>
<td>2</td>
<td>3</td>
<td>=1</td>
<td>=1</td>
</tr>
<tr>
<td>ROM</td>
<td>1</td>
<td>=1</td>
<td>=1</td>
<td>=1</td>
</tr>
<tr>
<td>VAS for pain</td>
<td>3</td>
<td>=1</td>
<td>5</td>
<td>=4</td>
</tr>
<tr>
<td>McGill pain questionnaire</td>
<td>=15</td>
<td>13</td>
<td>No Use</td>
<td>No Use</td>
</tr>
<tr>
<td>FIM</td>
<td>9</td>
<td>No Use</td>
<td>=1</td>
<td>=10</td>
</tr>
<tr>
<td>Barthel Index</td>
<td>14</td>
<td>No Use</td>
<td>=11</td>
<td>No Use</td>
</tr>
<tr>
<td>SF-36</td>
<td>No use</td>
<td>No Use</td>
<td>No Use</td>
<td>No Use</td>
</tr>
<tr>
<td>Berg Balance Scale</td>
<td>4</td>
<td>=4</td>
<td>=6</td>
<td>=4</td>
</tr>
<tr>
<td>Tinetti gait and balance</td>
<td>6</td>
<td>=10</td>
<td>10</td>
<td>=1</td>
</tr>
<tr>
<td>Timed Up and Go</td>
<td>=7</td>
<td>=7</td>
<td>=6</td>
<td>=7</td>
</tr>
<tr>
<td>Glasgow Coma Scale</td>
<td>=15</td>
<td>No Use</td>
<td>13</td>
<td>No Use</td>
</tr>
<tr>
<td>2, 6 or 12-minute walk test</td>
<td>11</td>
<td>=10</td>
<td>=8</td>
<td>=7</td>
</tr>
<tr>
<td>Borg’s rating of perceived exertion</td>
<td>=7</td>
<td>=4</td>
<td>=11</td>
<td>6</td>
</tr>
<tr>
<td>Functional reach</td>
<td>5</td>
<td>=7</td>
<td>=1</td>
<td>=7</td>
</tr>
<tr>
<td>Gait speed</td>
<td>10</td>
<td>=10</td>
<td>=8</td>
<td>=10</td>
</tr>
<tr>
<td>Oswestry Low Back Pain</td>
<td>12</td>
<td>6</td>
<td>No Use</td>
<td>No Use</td>
</tr>
<tr>
<td>Neck Disability Index</td>
<td>13</td>
<td>=7</td>
<td>No Use</td>
<td>No Use</td>
</tr>
</tbody>
</table>