

## **BACKGROUND INFORMATION**

Research leading to the development of ICFmeasure.com was funded by the National Institute of Disability and Rehabilitation Research (NIDRR). The goal of this research was to develop an efficient and precise measurement system based on the Activity dimension of the International Classification of Functioning, Disability and Health (ICF). Equiprecise measurement (i.e., measurement across the entire range of a construct) was applied to activities involving movement, moving around and daily life tasks as defined by the Activity dimension of the ICF. This new measure affords scope and exactness unavailable from other disability measures. This is possible by selectively directing individualized questions to a respondent from a large item bank. In addition, this activity measure is accessible worldwide through the web and information obtained from ICFmeasure.com will be useful for individuals with disabilities, consumer groups, health care providers and policy makers.

## **PHASES OF THE PROJECT**

### **International Classification of Functioning, Disability And Health (ICF) Model**

The World Health Organization's International Classification of Functioning, Disability and Health (ICF) provided a conceptual framework and classification system for developing items used in this study. The Activity dimension of this model was our basis for generating questions since our interest was measuring a person's physical ability.

Within the Activity dimension, we developed separate measures for the following constructs: 1) Mobility, 2) Carrying, moving and manipulating objects, 3) Walking and moving, 4) Moving around using a wheelchair/scooter, and 5) Self care activities. (See Appendix 1)

## **Focus Groups**

Items adopted from the ICF model were presented to focus groups of individuals with disabilities. Focus groups included 30 individuals divided into male and female groups as well as spinal cord injury and non-spinal cord injury groups. During the focus groups, individuals were presented with related items (those making up a single construct, for example, walking items), asked to comment on the clarity of items and to suggest additional items. One hundred and seventeen modifications were made to the item bank based on these recommendations.

## **Professional Panel**

Following the consumer focus groups, items were presented to a professional panel consisting of health care researchers and consumers for further modification and verification. Comments made by the professional panel resulted in the elimination of some phrases containing jargon, addition of items and further clarification of items.

## **Cognitive Interviewing**

Following focus group and professional panel input, an initial item bank was created. Cognitive interviewing techniques were further used to improve the clarity of each question. Thirty-two individuals with upper extremity, lower extremity, low back pain or spinal cord injury were interviewed (8 from each diagnostic group). Participants were individually interviewed using a modified “think-aloud” technique. Interviewers asked the participants to respond to questions, describe their interpretation of these questions and finally to discuss how they arrived at their responses. Each interview was audio taped, transcribed and reviewed by the research team. This process led to approximately 60 modifications to the item bank.

### **Paper and Pencil Field Test**

The above modifications resulted in a 255-item paper and pencil version of the ICF Activity Measure. Four hundred and thirteen individuals (from diagnostic categories including upper extremity injury, lower extremity injury, back pain and spinal cord injury) completed the instrument. Data was entered into an *Access* database and then transferred to *SPSS* for calculation of descriptive statistics. Rasch analysis, an item response theory (IRT) method, and principal components analysis were used to evaluate the psychometric properties of the item bank. These analyses revealed very high person reliability indices (analogous to Cronbach's alpha) ranging from .86-.96 across the constructs. In addition, the construct "carrying, moving and manipulating objects" was divided into two new constructs, Fine hand use and Gross upper extremity use. Ceiling effects in the constructs Fine hand use and Moving around using a wheelchair/scooter lead to the addition of more challenging items. The resulting item bank was used as the question base for the development of the computerized version the ICF Activity Measure, ICFmeasure.com.

### **ICFmeasure.com – A Web Based Computerized Adaptive Survey**

ICFmeasure.com was build using a web server and is capable of online data storage. This instrument is programmed to operate off a browser (e.g., Microsoft Explorer or Netscape), thereby allowing administration on a stand-alone computer or via the web. ICFmeasure.com is modifiable, allowing the addition, deletion or alteration of questions and their calibrations. The administrative core of the instrument allows setting a wide range of functions including the estimation method (e.g., 1, 2, 3 parameter Item Response Theory models), initial theta value (i.e., directing the initial question that most closely

matches the ability level of the respondent) and exit condition (e.g., indicating the level of precision needed before exiting the measure). Questions are targeted to individuals at their ability level requiring only 5-8 questions per construct (a total of approximately 30 questions) to arrive at a final measure of person ability (See Appendix 2). Finally, immediate feedback is provided to the respondent/clinician in the form of a graph and summary statistics. A prototype of the instrument can be accessed at <http://www.ICFmeasure.com>.

For more information please contact the principal investigator, Craig Velozo, via email at [CVelozo@php.ufl.edu](mailto:CVelozo@php.ufl.edu) or telephone at 352-273-6044.

## **Appendix 1:**

### **Constructs with Example Questions:**

#### **Mobility**

*Total number of questions – 64*

##### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) staying in a lying position on your favorite side for 1 hour (while making only minor adjustments)?
- 2) staying in a standing position for 1-2 hours (while making only minor adjustments)?
- 3) shifting your weight while sitting in a chair without armrests?
- 4) changing position from standing to sitting in a chair?
- 5) moving yourself into the bathtub to take a bath?

#### **Gross Upper Extremity**

*Total number of questions – 29*

##### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) lifting 5 pounds (for example, bag of sugar or large telephone book) from waist height to shoulder height with your hand(s)?
- 2) lifting 25 pounds (for example, large bag of dog food or cat litter) from floor to waist height with your hand(s) and arm(s)?
- 3) carrying 10 pound (for example, grocery bag or 12-pack of soft drinks) in your hand(s) and arm(s) 25 feet (for example, from car to front door)?
- 4) carrying 10 pounds (for example, full laundry basket) down one flight of stairs?
- 5) pulling open a heavy door (for example, department/convenience store door)?

#### **Fine Hand**

*Total number of questions – 27*

##### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) grasping and turning a round doorknob with your preferred hand?
- 2) turning a key in a door lock with your preferred hand?
- 3) pushing buttons on a television remote control with your preferred hand?
- 4) unscrewing a jar lid?
- 5) picking up small pills with your preferred hand?

## **Walking and Moving**

*Total number of questions – 20*

### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) walking within your home/living environment?
- 2) jogging one mile?
- 3) walking on gravel?
- 4) Climbing down two flights of stairs?
- 5) Stepping up or down a standard curb?

## **Moving Around Using a Wheelchair/Scooter**

*Total number of questions – 37*

### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) wheeling a manual wheelchair 1-2 blocks?
- 2) wheeling a manual wheelchair on carpeting?
- 3) wheeling a manual wheelchair up ramps?
- 4) driving a motorized wheelchair/scooter around obstacles on the floor (for example, toys, shoes)?
- 5) driving a motorized wheelchair/scooter onto a personal van lift?

## **Self Care Activities**

*Total number of questions – 80*

### 5 sample questions:

In the last 30 days how much difficulty have you had

- 1) washing your feet?
- 2) brushing your teeth?
- 3) putting on a T-shirt, sweatshirt, or pullover (for example, a shirt without buttons)?
- 4) managing your clothes while toileting (for example, zipping and unzipping or pulling pants on or off)?
- 5) swallowing liquid?