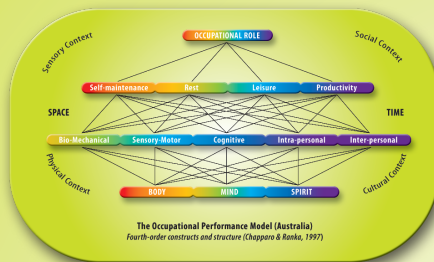


# DEVELOPMENT OF AN OCCUPATIONAL THERAPY SCALE OF UPPER LIMB OCCUPATIONAL PERFORMANCE FOLLOWING CVA

## OCCUPATIONAL THERAPY MODEL

- Occupational therapy practice with people following CVA focuses on overcoming activity limitations and participation restrictions people experience, by addressing the impairments and environmental barriers that limit participation.
- One conceptualisation of occupational therapy is illustrated by the Occupational Performance Model (Australia)
- The OPM(A) is the model underlying this research.



## BACKGROUND

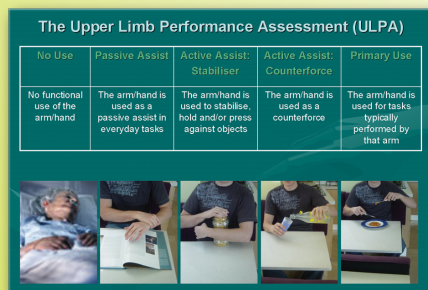
- Cerebrovascular accident (CVA) is a major health issue worldwide. One major consequence of CVA is upper limb dysfunction.
- Although numerous methods exist, they focus on the impairment only.
- No instrument was found that identifies and grades how a person who has had a CVA uses his or her affected upper limb to carry out his or her daily occupations, and the motor, sensory and cognitive operations that support that use.

## STUDY AIM

The aim of this study was to validate a prototype scale.

The upper Limb Performance Assessment (ULPA)  
(Chapparo & Ranka, 2002).

**PART ONE** of the ULPA focuses on rating arm use during the performance of daily tasks and routines. Therapists rate their client's upper limb use on a continuum of five conditions ranging from 'no use' to 'primary use'.



These pictures represent each of the proposed levels of upper limb use. Observe the person's left arm in each of the pictures.

**PART TWO** lists key minimum biomechanical, sensory-motor and cognitive/perceptual component operation criteria that were thought to predict specific upper limb use.

The component operation criteria include:

Biomechanical (range of motion and control)

Sensory-motor (sensation and control over abnormal muscle tone)

Cognitive/perceptual (consciousness, awareness of space and motor planning ability).

The research questions addressed were as follows:

- Do the levels of upper limb use contained in the ULPA account for all possible instances of upper limb use following a CVA?
- Do any of the proposed key minimum biomechanical, sensory-motor and cognitive/perceptual component operations correlate with the levels of upper limb use contained in the ULPA?

## METHOD

- Occupational therapist participants used a deconstructed version of the ULPA to collect data on 84 of their CVA clients over a six month period.
- A two-part methodological, nonexperimental design incorporating both qualitative and quantitative methods was then used to answer each of the research questions.

**PART A** involved determining the construct validity of **Part One** of the ULPA.

Data were examined using qualitative methods to determine if any instances of upper limb use were described by therapists that could not be accounted for by the construct categories described in **Part One** of the ULPA.

**PART B** involved using quantitative methods to identify whether there is a correlation between how a person uses his or her upper limb (**Part One** of the ULPA) and key minimum biomechanical, sensory-motor and cognitive/perceptual component operations (**Part Two** of the ULPA).

## RESULTS

- Analysis of the findings for this sample confirmed that all instances of upper limb use were accounted for on the ULPA.
- Significant correlations between arm use and key component operations, and for hand use and key component operations were found.
- A new version of the ULPA for arm and hand use was then developed representing these findings.

### UPPER LIMB PERFORMANCE ASSESSMENT

NO USE	PASSIVE ASSIST	ACTIVE ASSIST/STABILISER	ACTIVE ASSIST/COUNTERFORCE	PRIMARY USE
No functional use of the arm	The arm is used as a passive assist to overcome tasks	The arm is used to stabilise hold or press against objects	The arm is used to assist in counterforce, push, lift, stabilize heavy objects. The arm is used to support the body	The arm is used for tasks typically performed by that of the arm
The arm is characterised generally by flaccid muscle tone at the shoulder & elbow	Minimal muscle tone is developing in the shoulder	Moderately increased muscle tone is present in the elbow	Increased muscle tone is developing in the shoulder & elbow	There are no problems with muscle tone in the shoulder & elbow
Minimal muscle tone is developing in the shoulder	Moderately increased muscle tone is present in the shoulder	Severely increased muscle tone is present in the shoulder & elbow	Voluntary control of forward reach is present in gross voluntary control of overhead reach patterns are developing in the shoulder & elbow	Voluntary control of forward reach is present in gross voluntary control of overhead reach patterns are developing in the shoulder
Moderately increased muscle tone is present in the elbow	Minimal voluntary control of forward reach is present in the shoulder & elbow	Increased muscle tone is developing in the shoulder & elbow	Power present can withstand moderate (4) resistance at the shoulder & elbow	Voluntary control of forward reach is present in overhead reach is present in the shoulder & elbow
No voluntary movement is present in the shoulder or elbow	No power is present (muscle grade 0-1) in the shoulder & elbow	Gross voluntary control of forward reach patterns is present in the shoulder & elbow	Perceptual deficits present: apraxia to form & space deficits, but the client is aware of them	Power present can withstand moderate (4) resistance at the shoulder & elbow
Minimal voluntary control of forward reach is present in the shoulder & elbow	Some power is developing (2-3) in voluntary control of reach in the shoulder & elbow	Voluntary control of forward reach is present in gross voluntary control of overhead reach patterns are developing in the shoulder & elbow	Power present can withstand moderate (4) resistance at the shoulder & elbow	Power present can withstand significant (5) resistance at the shoulder & elbow
No power is present (muscle grade 0-1) in the shoulder or elbow	Power present is sufficient to withstand the weight of gravity/minimal resistance (1-2) in the shoulder	Some power is developing (2-3) in the voluntary control of reach in the shoulder	Power present can withstand moderate (4) resistance at the shoulder	Position sense is present in the shoulder & elbow
Some power is developing (2-3) in the voluntary control of reach in the shoulder & elbow	Marked sensory deficits exist in the arm	Power present is sufficient to withstand the weight of gravity/minimal resistance (1-2) in the shoulder & elbow	Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them	Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them
Marked sensory deficits exist in the arm	Protective sensation (sharp/dull) is present in the arm	Power present can withstand moderate (4) resistance at the shoulder	Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them	Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them
Sensation in the arm is at the level of sensory awareness only	Sensory conscious or drowsy	Oriented to person place & time	Perceptual deficits are present: apraxia to form & space deficits, but client is aware of them	No major perceptual deficits are present
COGNITIVE	Conscious & alert			
Sensory conscious or drowsy	Perceptual deficits are present: apraxia to form & space deficits, but the client is aware of them	Perceptual deficits are present: apraxia to form & space deficits, but the client compensates for them		
Conscious & alert				
Oriented to 2/3 (person, place & time)				
Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them				
Perceptual deficit is present: apraxia to form & space deficits, but client is aware of them				
Perceptual deficits are present: apraxia to form & space deficits, but client compensates for them				

## IMPLICATIONS

### PRACTICE

Although further research is required the refined ULPA that now exists:

- Can be used by occupational therapists to establish more realistic and incremental goals for arm and hand use following CVA
- Can be used by occupational therapists to design intervention with a clearer idea of how well the upper limb is likely to be used by a person to carry out his or her daily tasks and routines.
- Requires minimal time for administration and virtually no equipment to administer.
- And is simple which means minimal cost to the healthcare system.

### RESEARCH

This research is limited however it created opportunities and avenues for future research. With this and further research, an instrument such as the ULPA may be used effectively by therapists and researchers to gather data related to upper limb function and CVA.

### EDUCATION

- Development of the ULPA through research will contribute to its effectiveness as an educational tool for undergraduate and post-graduate occupational therapy students.
- A developed and refined ULPA can be used to enhance education regarding models for practice, upper limb function, recovery of upper limb function following CVA, component operations and their contribution to upper limb function as well as intervention strategies for CVA clients.

### THEORY BUILDING

- The research supports the constructs, relationships and processes proposed in the *Occupational Performance Model (Australia)* (OPMA (A) (Chapparo & Ranka, 1997).

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The University of Sydney