



## Gross Motor Function Measure (GMFM) New, Shortened Versions

Movement and Participation  
in Life Activities of Young Children  
*Information for Families and Service Providers*

### The Move & PLAY study.....in brief:

**Who participated?** 430 preschool (age 18 months to 5 years) children with [Cerebral Palsy](#) (CP) and their families were recruited from many regions of Canada and the USA; all children had CP or problems with motor activities, [muscle tone](#) and [balance](#).

**What did we do?** We focused on learning what helps children with CP progress in their ability to move around, take care of themselves ([self-care](#): feeding, dressing, bathing) and [play](#).

**What was our goal?** We wanted to find out what we can change about the way we help young children who need rehabilitation services, so we can focus on providing the services that are most beneficial.

**How did we do this?** We collected information about many characteristics of the child, the family, and the recreation and rehabilitation services they receive, during 3 sessions over a one-year period.

### Background information about the GMFM:

- **GMFM-66**<sup>1</sup> is widely used in clinical practice and research by therapists
- It is the “gold standard” to measure gross motor function (that is, how children with CP move around)
- It measures change over time and/or as a result of treatment
- In the full version, there are 66 items and it takes about 45 to 60 minutes to assess a child (time varies according to each child’s abilities)
- A shortened version- **GMFM-66-IS**<sup>2</sup> - uses one of 4 sets of test items based on an individual child’s ability
- Shorter versions are desirable; only items relevant to the child’s current ability are tested

### Why did we do the GMFM “sub-study”?

- An important purpose of the Move & PLAY study is to **reduce the “burden” of time** needed to accurately assess children’s motor abilities; this efficiency is beneficial to children, parents, and therapists
- The Move & PLAY team developed a new, even shorter method of using the GMFM: the **GMFM-66 B&C**<sup>3</sup> ([link](#)). It uses a “[basal and ceiling](#)” approach; child is assessed using items that range between the easiest and most difficult levels of his or her abilities; accurate scores can be obtained using as few as 15 items
- To find out if these shortened measures are as [reliable](#) and [valid](#) as the original, we tested the **GMFM-66 B&C and GMFM-66-IS**, comparing them to each other and also to the original version (GMFM-66)

### What did we do?

- Participants: **26 children with CP**, aged 2 to 6 years, across all [Gross Motor Function Classification System](#) levels (GMFCS<sup>4</sup>), and who attended rehabilitation centers in Southwestern Ontario. GMFCS has 5 levels of motor abilities; children in level I have the highest motor abilities, and children in level V the least motor abilities
- 2 assessments: (1) Children were tested using both shortened versions and the full GMFM-66  
(2) 2 weeks later, children were tested again with both shortened versions

### What did we learn?

- On average, the GMFM-66 B&C used 16-17 items for testing, compared to the GMFM-66-IS, which used 32-33 items
- Scores obtained from these 2 versions were highly [correlated](#) when done on the same or different occasions with the child
- Scores obtained using shortened versions also correlated highly with scores using the original GMFM-66

Words highlighted in blue link to definitions in our glossary. The glossary and other summaries reporting the results of this study are available on the CanChild website : <http://www.canchild.ca/en/ourresearch/moveplay.asp>

- The majority of PTs who used both tests preferred using the GMFM 66 B&C for various reasons:
  - Fewer items when using the GMFM-66-B&C and these items were more suitable to the individual child's abilities
  - They expressed some difficulties in making decisions about which item set to test when using the GMFM-66-IS
- **We assessed the 430 children in the Move & PLAY study using the GMFM-66 B&C:**  
**The GMFM-66 B&C scores were valid in showing differences** in children by age and GMFCS level:
  - **Effect of gender:** Boys and girls performed similarly on the test
  - **Effect of age:** In general, scores were higher in older children (as would be expected)
  - **Effect of GMFCS level:** Children classified as having higher motor function on the GMFCS scored higher on the GMFM-66-B&C

### What does this mean?

#### Thoughts for families

- ◇ A very accurate assessment of gross motor abilities is obtained with the GMFM-66-B&C and it takes less time
- ◇ Discuss with your therapist if the shorter version of the test is suitable for assessing and documenting your child's motor function
- ◇ Using a shorter motor assessment will provide your therapist with more time to assess other aspects of your child and family that are important to you

#### Thoughts for service providers

- ◇ Therapists can feel confident that either of the abbreviated versions of the GMFM-66 are valid and reliable to use
- ◇ Therapists in our study preferred the GMFM-66-B&C [\(link\)](#)
- ◇ Consider using a shorter version to document motor function in a more efficient manner by assessing items around a child's ability level
- ◇ Using a shorter motor assessment will provide more time to assess other aspects of the child and family

#### References:

1. Russell DJ, Rosenbaum PL, Avery LM, Lane M. *Gross Motor Function Measure (GMFM-66 & GMFM-88) User's Manual*. London, UK: Mac Keith Press; 2002.
2. Russell DJ, Avery L, Walter S, Hanna S, Bartlett D, Rosenbaum P, Palisano R, Gorter JW. Development and validation of item sets for the GMFM-66 to improve efficiency of administration in children with cerebral palsy. *Developmental Medicine and Child Neurology*. 2010;52:e48-e54.
3. Brunton LK, Bartlett DJ. Validity and reliability of two abbreviated versions of the Gross Motor Function Measure. *Physical Therapy*. 2011;91:577-588.
4. Palisano RJ, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B: Development and validation of a Gross Motor Function Classification System for children with cerebral palsy. *Developmental Medicine and Child Neurology* 1997;39:214-223.

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For more details regarding these new versions of the GMFM please refer to our paper (#3 on reference list above)



**Understanding Determinants of Basic Motor Abilities, Self-care, and Play of Young Children with Cerebral Palsy**

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