Clinical Question: In children aged 18 years and younger with CP, will a neurofacilatory approach be more effective than a functional task approach for improving functional mobility skills, range of motion, and strength?

The **Gross Motor Function Classification System (GMFCS)** is a five-level, ordinal scale classification system measuring both functional limitations and disability focusing on the child’s self-initiated sitting and walking. Each level has a different description for children of many age groups. It is able to predict walking in children with cerebral palsy. The levels range from I to V, I being the most independence in their motor function and V is the least. The interrater reliability for GMFCS has been reported as agreeable with a kappa (k) coefficient of 0.75 in children 2 years and older. For more information see [http://www.canchild.ca/en/measures/gmfcs_expanded_revised.asp](http://www.canchild.ca/en/measures/gmfcs_expanded_revised.asp).

The **Gross Motor Function Measure (GMFM-66 or GMFM-88)** is a test for measuring motor function as it develops in children that have been diagnosed with Cerebral Palsy. This test consists of either 66 or 88 questions and these questions cover 5 important areas of developmental motor function. The 5 areas include: 1) lying and rolling, 2) sitting, 3) kneeling and crawling, 4) standing, 5) walking, running and jumping. When the children are tested, they are required to execute a task that relates to one of the 5 areas previously mentioned. The evaluator then scores the child on a nominal scale of 0-3 based on their performance. A score of 0 indicates that the child could not initiate the task, a score of 1 shows that the child was able to initiate the task but performed less than 10% of what was required, a score of 2 indicates that the child was able to execute more than 10% of the task but was unable to complete it, and a score of 3 is given when the child is able to complete the task. Each of the 5 areas are recorded as a percentage of the maximum score, and each of the 5 areas contribute equally to the overall GMFM score. The test-retest value of the GMFM is very high (intra class coefficient = 0.99). The intra class correlation coefficient of the GMFM-88 has been reported as very high as well with a score of 0.90. The interrater reliability of the GMFM was reported as almost perfectly agreeable at 0.99. Therapists will score the GMFM on a separate form, then enter scores on the data form as indicated. For more information please go to [http://www.canchild.ca/en/measures/gmfm.asp](http://www.canchild.ca/en/measures/gmfm.asp).

The **Pediatric Outcomes Data Collection Instrument** is a measure of upper extremity function, transfers and mobility, physical function and sports, comfort, happiness and satisfaction, and expectations for treatment reported by parents for children 2-18 years old. This is used to measure the child’s participation in physical activity. Questions regarding the child’s overall well-being are included. Specifically questions about: general energy, pain and discomfort, and time missed from school. The internal consistency of the PODCI was moderate to high with a Cronbach’s alpha of 0.76-0.97. The interrater reliability of the PODCI was reported as having a moderate to almost perfect agreement with kappa coefficients of 0.45-0.87.
Because our clinical question focused on function, mobility skills, range of motion, and strength; the measurement tools described above allow for tracking these parameters throughout the patient’s life. These measurement tools provide a basis for evaluating various types of impairments, functional limitations, and disabilities.

<table>
<thead>
<tr>
<th>Measurement Tool</th>
<th>Interrater Reliability</th>
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<tbody>
<tr>
<td>GMFCS</td>
<td>0.75</td>
</tr>
<tr>
<td>GMFM</td>
<td>0.99</td>
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<tr>
<td>PODCI</td>
<td>0.45-0.87</td>
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</tbody>
</table>

Created By Lanisa Pechacek and Ashley Perkins                          Date: June 19, 2011

References:


Minimal Data Set for Children with Cerebral Palsy (CP)

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<tbody>
<tr>
<td>Pt’s name:</td>
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<td>Pt’s age:</td>
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<tr>
<td>Date:</td>
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<td></td>
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<tr>
<td>GMFCS level:</td>
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</table>

|                                | Lying and rolling:          | Sitting:                    | Kneeling and crawling:      | Walking, running, and jumping: |
| GMFM maximum score:            |                             |                             |                             |                             |

| PODCI rating:                  |                             |                             |                             |                             |
| Surgery:                       |                             |                             |                             |                             |
| Botox:                         |                             |                             |                             |                             |
| Assistive Devices:             |                             |                             |                             |                             |

**GROSS MOTOR FUNCTION CLASSIFICATION SYSTEM (GMFCS)**

GENERAL HEADINGS FOR EACH LEVEL

LEVEL I - Walks without Limitations

LEVEL II - Walks with Limitations

LEVEL III - Walks Using a Hand-Held Mobility Device

LEVEL IV - Self-Mobility with Limitations; May Use Powered Mobility

LEVEL V - Transported in a Manual Wheelchair

http://www.canchild.ca/en/measures/gmfcs_expanded_revised.asp

**GROSS MOTOR FUNCTION MEASURE (GMFM)**


**PEDIATRIC OUTCOMES DATA COLLECTION INSTRUMENT**

Pediatric Outcomes Questionnaire
Developed by:
American Academy of Orthopaedic Surgeons®
Pediatric Orthopaedic Society of North America
American Academy of Pediatrics
Shriner’s Hospitals

To be completed by the parent for children 2 – 10 years old

Today’s Date / /

This questionnaire will help us to better understand your general health and any problems related to bone and muscle conditions. Your completion of this questionnaire is completely voluntary and your responses will be held in the strictest confidence. Please answer every question. Some questions may look like others, but each one is different. There are no right or wrong answers. If you are not sure how to answer a question, just give the best answer you can. You can make comments in the margin. We do read all your comments, so feel free to make as many as you wish.

Your Child's Birth Date / /
Your Child's Social Security Number ___________________
Your Social Security Number ______________________

Some kind of problems can make it hard to do many activities, such as eating, bathing, school work, and playing with friends. We would like to find out how your child is doing. (Circle one response on each line.)

During the last week was it easy or hard for your child to:

<table>
<thead>
<tr>
<th>Activity</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lift heavy books?</td>
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<tr>
<td>2. Pour a half-gallon of milk?</td>
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<tr>
<td>3. Open a jar that has been opened before?</td>
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<td>4. Use a fork and spoon?</td>
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<td>5. Comb his/her hair?</td>
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<td>6. Button buttons?</td>
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<td>7. Put on his/her coat?</td>
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<tr>
<td>8. Write with a pencil?</td>
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</tbody>
</table>
9. On average, **over the last 12 months**, how often did your child miss school (preschool, day care, camp, etc.) because of his/her health?

1. Rarely
2. Once a month
3. Two or three times a month
4. Once a week
5. More than once a week
6. Does not attend school, etc.

During the last week how happy has your child been with: (Circle one response on each line.)
Very happy: 1
Somewhat happy: 2
Not sure: 3
Somewhat unhappy: 4
Very unhappy: 5
Child is too young: 6

10. How he/she looks?
11. His/her body?
12. What clothes or shoes he/she can wear?
13. His/her ability to do the same things his/her friends do?
14. His/her health in general?

During the last week, how much of the time: (Circle one response on each line.)
Most of the time: 1
Some of the time: 2
A little of the time: 3
None of the time: 4

15. Did your child feel sick and tired?
16. Were your child full of pep and energy?
17. Did pain or discomfort interfere with your child's activities?

During the last week, has it been easy or hard for your child to: (Circle one response on each line.)
Easy: 1
A little hard: 2
Very hard: 3
Can't do at all: 4
Too young for this activity: 5

18. Run short distances?
19. Bicycle or tricycle?  
   1 2 3 4 5

20. Climb three flights of stairs?  
   1 2 3 4 5

21. Climb one flight of stairs?  
   1 2 3 4 5

22. Walk more than a mile?  
   1 2 3 4 5

23. Walk three blocks?  
   1 2 3 4 5

24. Walk one block?  
   1 2 3 4 5

25. Get on and off a bus?  
   1 2 3 4 5

26. How often does your child need help from another person for walking and climbing? (Circle one response.)  
   1 Never  2 Sometimes  3 About half the time  4 Often  5 All the time

27. How often does your child use assistive devices (such as braces, crutches, or wheelchair) for walking and climbing? (Circle one response.)  
   1 Never  2 Sometimes  3 About half the time  4 Often  5 All the time

During the last week, has it been easy or hard for your child to: (Circle one response on each line.)  
Easy: 1  
A little hard: 2  
Very hard: 3  
Can't do at all: 4  
Too young for this activity: 5

28. Stand while washing his/her hands and face at a sink?  
   1 2 3 4 5

29. Sit in a regular chair without holding on?  
   1 2 3 4 5

30. Get on and off a toilet or chair?  
   1 2 3 4 5

31. Get in and out of bed?  
   1 2 3 4 5

32. Turn doorknobs?  
   1 2 3 4 5

33. Bend over from a standing position and pick up something off the floor?  
   1 2 3 4 5

34. How often does your child need help from another person for sitting and standing? (Circle one response.)  
   1 Never  2 Sometimes  3 About half the time  4 Often  5 All the time

35. How often does your child use assistive devices (such as braces, crutches, or wheelchair) for sitting and standing? (Circle one response.)  
   1 Never  2 Sometimes  3 About half the time  4 Often  5 All the time

36. Can your child participate in recreational outdoor activities with other children the same age?  
(For example: bicycling, tricycling, skating, hiking, and jogging) (Circle one response.)  
   1 Yes, easily  2 Yes, but a little hard  3 Yes, but very hard  4 No

If you answered “no” to Question 36 above, was your child's activity limited by: (Circle yes to all that apply)
Yes
37. Pain?
38. General Health?
39. Doctor or parent instructions?
40. Fear the other kids won’t like him/her?
41. Dislike of recreational outdoor activities?
42. Too young?
43. Activity not in season?
44. Can your child participate in pickup games or sports with other children the same age? 
(For example: tag, dodge ball, basketball, soccer, catch, jump rope, touch football, hop scotch) 
(Circle one response.)
1 Yes, easily 2 Yes, but a little hard 3 Yes, but very hard 4 No
If you answered “no” to Question 44 above, was your child's activity limited by: (Circle yes to all that apply)
Yes
45. Pain?
46. General Health?
47. Doctor or parent instructions?
48. Fear the other kids won’t like him/her?
49. Dislike of pickup games or sports?
50. Too young?
51. Activity not in season?
52. Can your child participate in competitive level sports with other children the same age? 
(For example: hockey, basketball, soccer, football, baseball, swimming, running [track or cross country], gymnastics, or dance) (Circle one response.)
1 Yes, easily 2 Yes, but a little hard 3 Yes, but very hard 4 No
If you answered “no” to Question 52 above, was your child's activity limited by: (Circle yes to all that apply)
Yes
53. Pain?
54. General Health?
55. Doctor or parent instructions?
56. Fear the other kids won’t like him/her?
57. Dislike of pickup games or sports?
58. Too young?
59. Activity not in season?
60. How often in the last week did your child get together and do things with friends? (Circle one response.)
1 Often 2 Sometimes 3 Never or rarely
If you answered “sometimes” or “never or rarely” to Question 60 above, was your child's activity limited by: (Circle yes to all that apply)

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<table>
<thead>
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<tbody>
<tr>
<td>61. Pain?</td>
<td>Yes</td>
</tr>
<tr>
<td>62. General Health?</td>
<td>1</td>
</tr>
<tr>
<td>63. Doctor or parent instructions?</td>
<td>1</td>
</tr>
<tr>
<td>64. Fear the other kids won’t like him/her?</td>
<td>1</td>
</tr>
<tr>
<td>65. Friends not around?</td>
<td>1</td>
</tr>
</tbody>
</table>

66. How often in the last week did your child participate in gym/recess? (Circle one response.)

- 1 Often
- 2 Sometimes
- 3 Never or rarely
- 4 No gym or recess

If you answered “sometimes” or “never or rarely” to Question 63 above, was your child's activity limited by: (Circle yes to all that apply)

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<tbody>
<tr>
<td>67. Pain?</td>
<td>Yes</td>
</tr>
<tr>
<td>68. General Health?</td>
<td>1</td>
</tr>
<tr>
<td>69. Doctor or parent instructions?</td>
<td>1</td>
</tr>
<tr>
<td>70. Fear the other kids won’t like him/her?</td>
<td>1</td>
</tr>
<tr>
<td>71. Dislike of gym/recess?</td>
<td>1</td>
</tr>
<tr>
<td>72. School not in session?</td>
<td>1</td>
</tr>
<tr>
<td>73. Does not attend school?</td>
<td>1</td>
</tr>
</tbody>
</table>

74. Is it easy or hard for your child to make friends with children his/her own age? (Circle one response.)

- 1 Usually easy
- 2 Sometimes easy
- 3 Sometimes hard
- 4 Usually hard

75. How much pain has your child had during the last week? (Circle one response.)

- 1 None
- 2 Very mild
- 3 Mild
- 4 Moderate
- 5 Severe
- 6 Very severe

76. During the last week, how much did pain interfere with your child's normal activities (including at home, outside of the home, and at school)? (Circle one response.)

- 1 Not at all
- 2 A little bit
- 3 Moderately
- 4 Quite a bit
- 5 Extremely

What expectations do you have for your child's treatment? As a result of my child's treatment, I expect my child: (Circle one response on each line.)

- Definitely yes: 1
- Probably yes: 2
- Not sure: 3
- Probably not: 4
- Definitely not: 5
77. To have pain relief. & 1 & 2 & 3 & 4 & 5  
78. To look better. & 1 & 2 & 3 & 4 & 5  
79. To feel better about himself/herself. & 1 & 2 & 3 & 4 & 5  
80. To sleep more comfortably. & 1 & 2 & 3 & 4 & 5  
81. To be able to do activities at home. & 1 & 2 & 3 & 4 & 5  
82. To be able to do more at school. & 1 & 2 & 3 & 4 & 5  
83. To be able to do more play or recreational activities (biking, walking, doing things with friends). & 1 & 2 & 3 & 4 & 5  
84. To be able to do more sports. & 1 & 2 & 3 & 4 & 5  
85. To be free from pain or disability as an adult. & 1 & 2 & 3 & 4 & 5  

86. If your child had to spend the rest of his/her life with his/her bone and muscle condition as it is right now, how would you feel about it? (Circle one response.)

1 Very satisfied  2 Somewhat satisfied  3 Neutral  4 Somewhat dissatisfied  5 Very dissatisfied