



GMFCS and GMFM

Ginny Paleg, PT, DScPT
Saturday 2:45-4:15

Clinics in Developmental Medicine | Mac Keith Press

Gross Motor Function Measure (GMFM-66 & GMFM-88)

User's Manual

2nd Edition



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1

Gross Motor Function Classification System – Expanded and Revised (GMFCS – E & R)

BEFORE 2ND BIRTHDAY

LEVEL I: Infants move in and out of sitting and floor sit with both hands free to manipulate objects. Infants crawl on hands and knees, pull to stand and take steps holding on to furniture. Infants walk between 18 months and 2 years of age without the need for any assistive mobility device.

LEVEL II: Infants maintain floor sitting but may need to use their hands for support to maintain balance. Infants creep on their stomach or crawl on hands and knees. Infants may pull to stand and take steps holding on to furniture.

LEVEL III: Infants maintain floor sitting when the low back is supported. Infants roll and creep forward on their stomachs.

LEVEL IV: Infants have head control but trunk support is required for floor sitting. Infants can roll to supine and may roll to prone.

LEVEL V: Physical impairments limit voluntary control of movement. Infants are unable to maintain antigravity head and trunk postures in prone and sitting. Infants require adult assistance to roll.

2

BETWEEN 2ND AND 4TH BIRTHDAY

LEVEL I: Children floor sit with both hands free to manipulate objects. Movements in and out of floor sitting and standing are performed without adult assistance. Children walk as the preferred method of mobility without the need for any assistive mobility device.

LEVEL II: Children floor sit but may have difficulty with balance when both hands are free to manipulate objects. Movements in and out of sitting are performed without adult assistance. Children pull to stand on a stable surface. Children crawl on hands and knees with a reciprocal pattern, cruise holding onto furniture and walk using an assistive mobility device as preferred methods of mobility.

LEVEL III: Children maintain floor sitting often by "W-sitting" (sitting between flexed and internally rotated hips and knees) and may require adult assistance to assume sitting. Children creep on their stomach or crawl on hands and knees (often without reciprocal leg movements) as their primary methods of self-mobility. Children may pull to stand on a stable surface and cruise short distances. Children may walk short distances indoors using a hand-held mobility device (walker) and adult assistance for steering and turning.

LEVEL IV: Children floor sit when placed, but are unable to maintain alignment and balance without use of their hands for support. Children frequently require adaptive equipment for sitting and standing. Self-mobility for short distances (within a room) is achieved through rolling, creeping on stomach, or crawling on hands and knees without reciprocal leg movement.

LEVEL V: Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. All areas of motor function are limited. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. At Level V, children have no means of independent movement and are transported. Some children achieve self-mobility using a powered wheelchair with extensive adaptations.

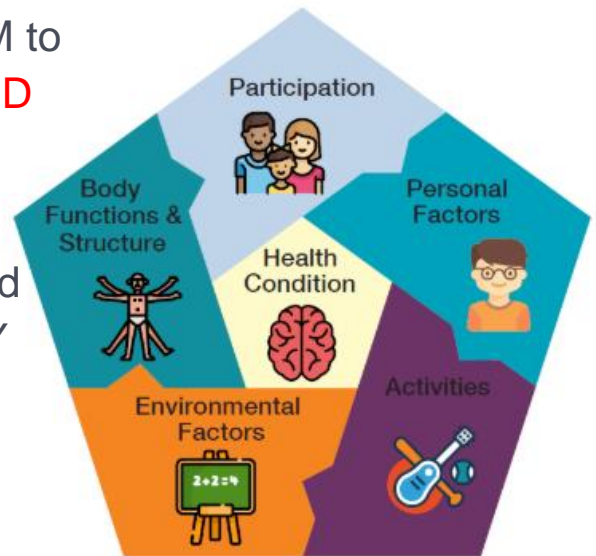
3



4

Honest and Comprehensive Assessment

- ❖ Dare to use the HINE and GMFM to accurately assess impairment **AND** function
- ❖ Dare to modify the environment
- ❖ This allows us to offer holistic and supportive care within the ICF-CY
- ❖ Always be hopeful
- ❖ Don't set limits



5

Where Shall We Start?

- I know the difference between:
 1. the levels in general
 2. the levels at every age
 3. the GMFM and GMFCS
 4. GMFM 66 and 88
 5. CP and DS curves
 6. Scoring by hand and using the GMAE software
 7. The different percentiles (hand scoring too)



6

Alphabet Soup

- Gross Motor Function Classification System (GMFCS)
- Gross Motor Function Measure (GMFM)
- Canchild.ca



7

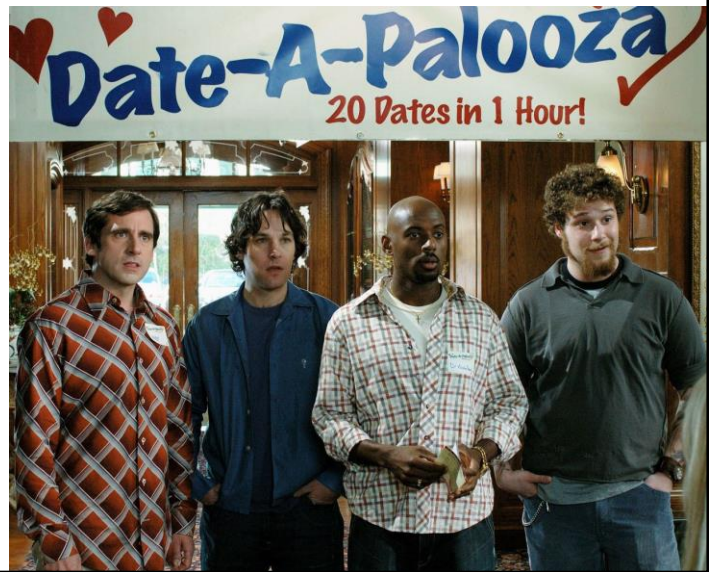
What are they?

- GMFCS is a classification system (performance)
- GMFM is an outcome measure with prediction capability (capacity)

8

GMFCS is like Speed Dating

- Quick summation
- Based on real life (performance) with orthotics and equipment



9

GMFCS II - Before 2nd birthday

- Infants maintain floor sitting but may need to use their hands for support to maintain balance.
- Infants creep on their stomach or crawl on hands and knees.
- Infants may pull to stand and take steps holding on to furniture.

10

GMFCS II- Between 2nd and 4th birthday

- Children floor sit but may have difficulty with balance when both hands are free to manipulate objects.
- Movements in and out of sitting are performed without adult assistance.
- Children pull to stand on a stable surface.
- Children crawl on hands and knees with a reciprocal pattern, cruise holding onto furniture and walk using an assistive mobility device as preferred methods of mobility.

11

GMFCS II- Between 4th and 6th Birthdays

- Children sit in a chair with both hands free to manipulate objects.
- Children move from the floor to standing and from chair sitting to standing but often require a stable surface to push or pull up on with their arms.
- Children walk without the need for a handheld mobility device indoors and for **short distances** on level surfaces outdoors.
- Children climb stairs holding onto a railing but are unable to run or jump.

12

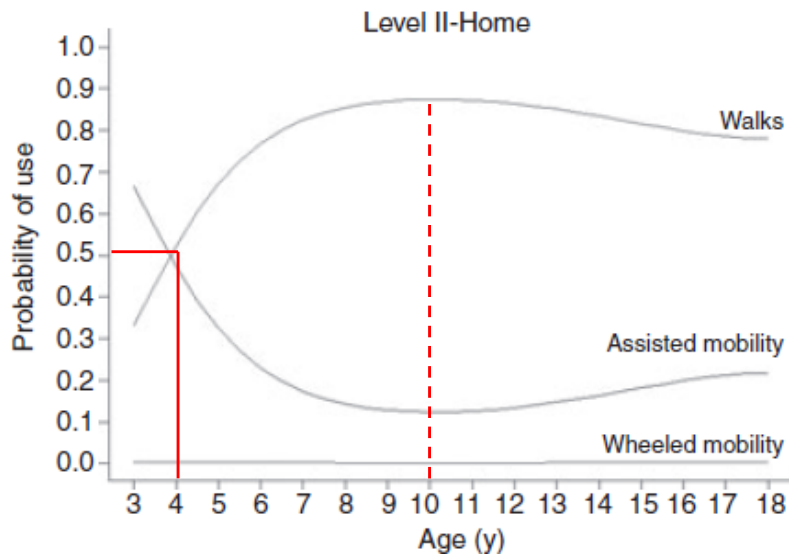
GMFCS Level II

- When do they get indep mobility?



13

Independent or assisted mobility, GMFCS II



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Palisano DMCN 2010, 52: 66-71

14

GMFCS III – before 2nd Birthday

- Infants maintain floor sitting when the low back is supported. Infants roll and creep forward on their stomachs.

15

GMFCS III between 2nd and 4th Birthday

- Children maintain floor sitting often by "W-sitting" (sitting between flexed and internally rotated hips and knees) and may require adult assistance to assume sitting.
- Children creep on their stomach or crawl on hands and knees (often without reciprocal leg movements) as their primary methods of self-mobility.
- Children may pull to stand on a stable surface and cruise short distances.
- Children may walk **short distances** indoors using a hand-held mobility device (walker) and adult assistance for steering and turning.

16

GMFCS III between 4-6 years

- Children sit on a regular chair but may require pelvic or trunk support to maximize hand function.
- Children move in and out of chair sitting using a stable surface to push on or pull up with their arms.
- Children walk with a **hand-held mobility device on level surfaces** and climb stairs with assistance from an adult.
- Children frequently are transported when traveling for long distances or outdoors on uneven terrain.

17

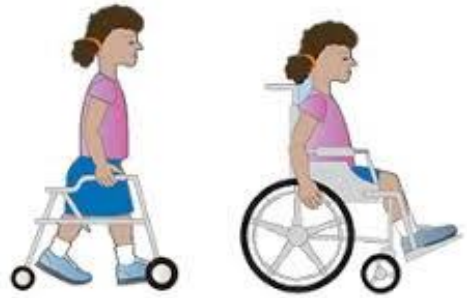
GMFCS III between 6-12 years

- Children walk using a **hand-held mobility device in most indoor settings**.
- When seated, children may require a seat belt for pelvic alignment and balance.
- Sit-to-stand and floor-to-stand transfers require physical assistance of a person or support surface.
- **When traveling long distances, children use some form of wheeled mobility.**
- Children may walk up and down stairs holding onto a railing with supervision or physical assistance.
- Limitations in walking may necessitate adaptations to enable participation in physical activities and sports including self-propelling a manual wheelchair or powered mobility.

18

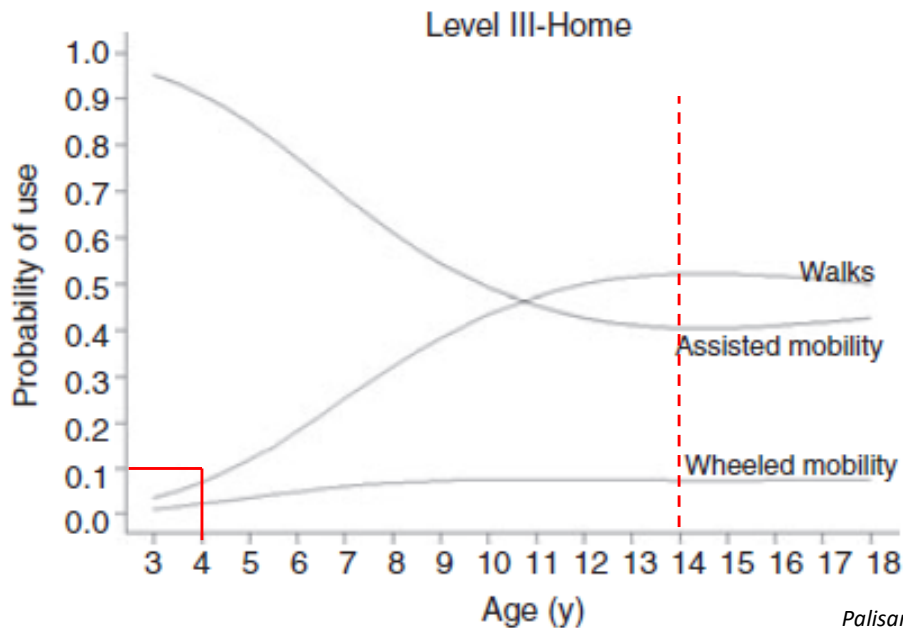
G M F C S I I I

When do they get independent mobility?



19

Independent or assisted mobility, GMFCS III



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20



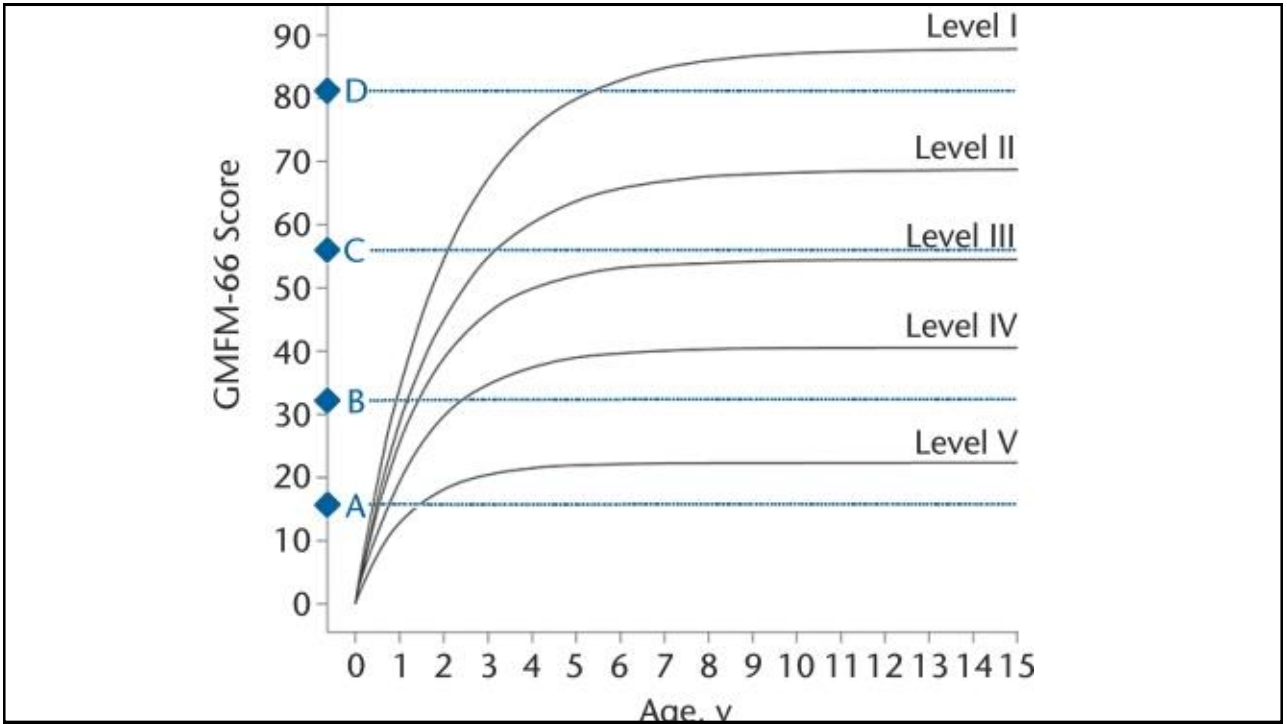
21

**GROSS MOTOR FUNCTION MEASURE
(GMFM)**

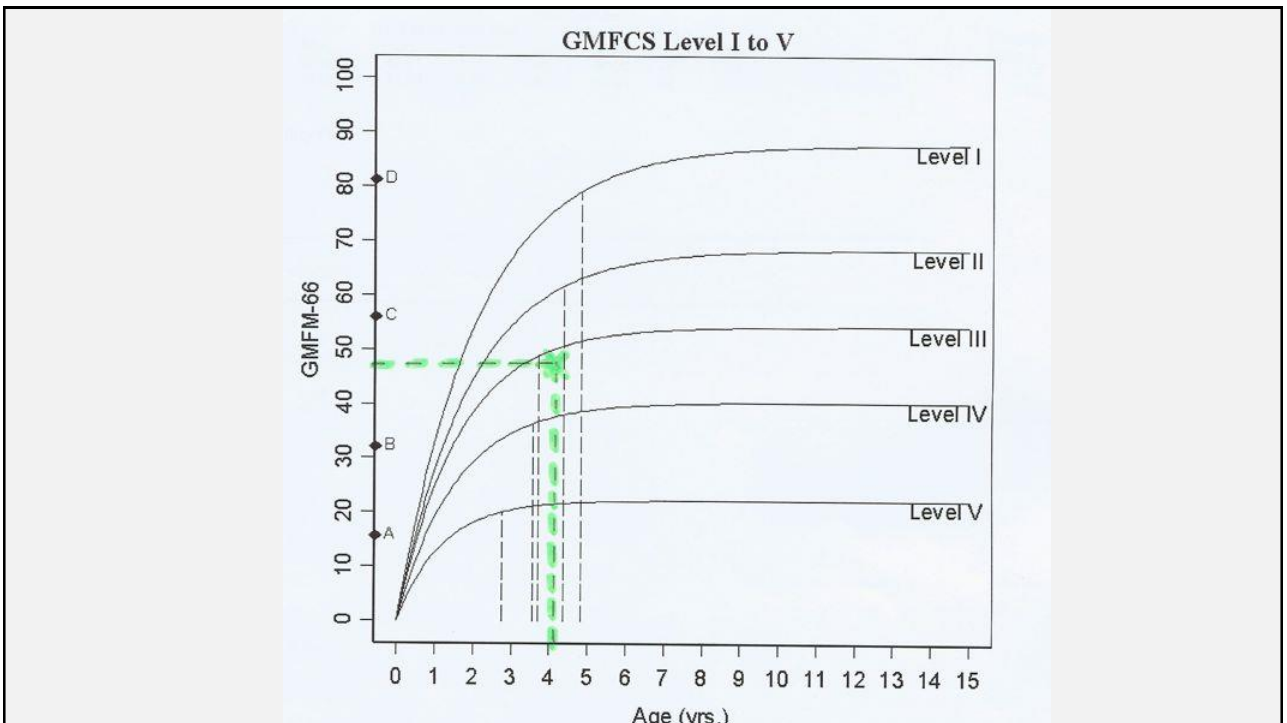
Capacity without any devices/braces

A red circular stamp with a distressed, ink-like texture, containing the number '22' in white.

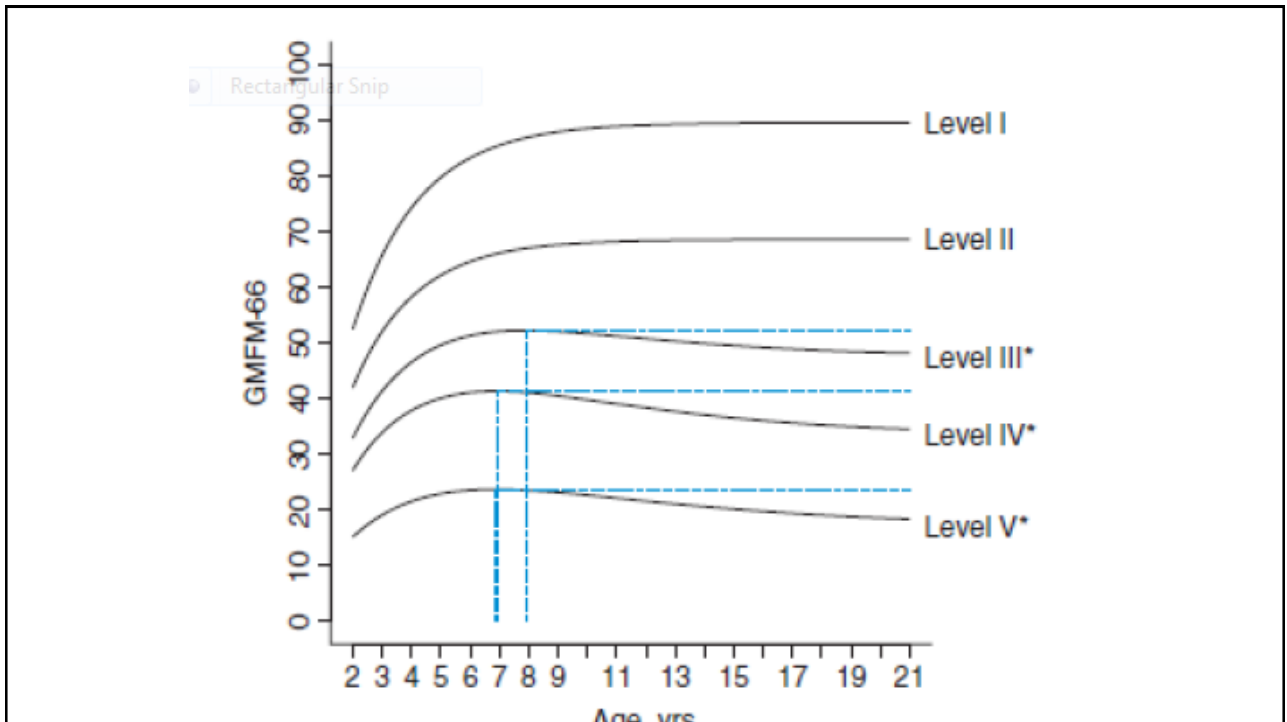
22



23



24



25

BARTLETT, 2014

- N=429
- 58% and 75% of the variance in motor function explained by:
 - Primary impairments (spasticity, quality of movement, postural stability, and distribution of involvement)
 - Secondary impairments (**strength, range of motion limitations, and reduced endurance**)
- NOTE*Postural stability contributed most to primary impairments and strength to secondary impairments. (Jefferies, 2015)

26



WHO IS GMFM/GMFCs VALID FOR?

<http://www.netchild.nl/pdf/classification-scp.pdf>

27



**ALL CAUSES OF LIFELONG
MOTOR/SENSORY IMPAIRMENT
THAT IS NOT PROGRESSIVE
(BEGAN BEFORE 2ND BIRTHDAY)**

**Anatomic. Metabolic,
Genetic, Trauma, etc.**

28

WANT A LIST?

- Smithers-Sheedy H, Badawi N, Blai E, Cans C, Himmelmann K, Krägeloh-Mann I, McIntyre S, Slee J, Uldall P, Watson L, Wilson M
- **What constitutes cerebral palsy in the twenty-first century?**
- Dev Med Child Neurol. 2014 Apr;56(4):323-8..



29

Cohen syndrome	Included if case meets clinical criteria for CP	216550	Q87.8
Congenital cytomegalovirus	Included if case meets clinical criteria for CP		P35.1
Congenital hypothyroidism	Included if case meets clinical criteria for CP		E00 E03.0 E03.1
Congenital myotonic dystrophy	Excluded: progressive and/or neuromuscular disorder not compatible with CP		G71.1
Congenital rubella syndrome	Included if case meets clinical criteria for CP		P35.0
Congenital toxoplasmosis, Toxoplasma embryopathy	Included if case meets clinical criteria for CP		P37.1
Congenital varicella, Varicella virus antenatal infection	Included if case meets clinical criteria for CP		P35.8
Congenital myopathy	Excluded: progressive and/or neuromuscular disorder not compatible with CP		
Cornelia de Lange syndrome (de Lange syndrome)	Included if case meets clinical criteria for CP	122470 300590 610759 614701	Q87.1

30

GMFCS IV – before age 2

- Infants have head control but trunk support is required for floor sitting. Infants can roll to supine and may roll to prone.

31

GMFCS IV – 2-4 years

- Children floor sit when placed, but are unable to maintain alignment and balance without use of their hands for support.
- Children frequently require adaptive equipment for sitting and standing.
- Self-mobility for short distances (within a room) is achieved through rolling, creeping on stomach, or crawling on hands and knees without reciprocal leg movement.

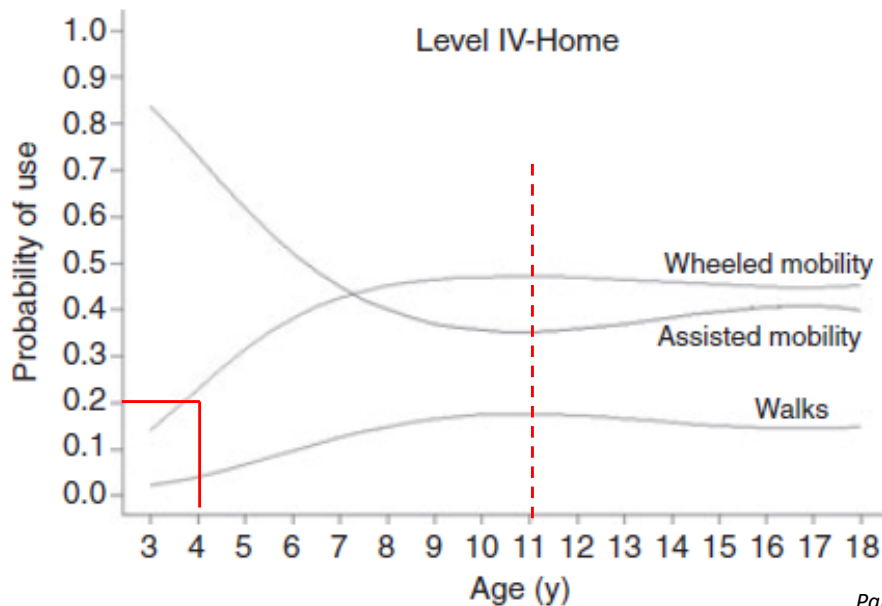
32

GMFCS IV – 4-6 years

- Children sit on a chair but need adaptive seating for trunk control and to maximize hand function.
- Children move in and out of chair sitting with assistance from an adult or a stable surface to push or pull up on with their arms.
- **Children may at best walk short distances with a walker and adult supervision but have difficulty turning and maintaining balance on uneven surfaces.**
- Children are transported in the community.
- Children may achieve self-mobility using a powered wheelchair.

33

Independent or assisted mobility, GMFCS IV



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34

Take Home Message for GMFCS

- Go slow – don't over estimate
- Recheck your work
- There is a parent version too
- Parents want to know, but keep hope alive



35

BETWEEN 6TH AND 12TH BIRTHDAY

Level I: Children walk at home, school, outdoors, and in the community. Children are able to walk up and down curbs without physical assistance and stairs without the use of a railing. Children perform gross motor skills such as running and jumping but speed, balance, and coordination are limited. Children may participate in physical activities and sports depending on personal choices and environmental factors.

Level II: Children walk in most settings. Children may experience difficulty walking long distances and balancing on uneven terrain, inclines, in crowded areas, confined spaces or when carrying objects. Children walk up and down stairs holding onto a railing or with physical assistance if there is no railing. Outdoors and in the community, children may walk with physical assistance, a hand-held mobility device, or use wheeled mobility when traveling long distances. Children have at best only minimal ability to perform gross motor skills such as running and jumping. Limitations in performance of gross motor skills may necessitate adaptations to enable participation in physical activities and sports.

36 Level III: Children walk using a hand-held mobility device in most indoor settings. When seated, children may require a seat belt for pelvic alignment and balance. Sit-to-stand and floor-to-stand transfers require physical assistance of a person or support surface. When traveling long distances, children use some form of wheeled mobility. Children may walk up and down stairs holding onto a railing with supervision or physical assistance. Limitations in walking may necessitate adaptations to enable participation in physical activities and sports including self-propelling a manual wheelchair or powered mobility.

Level IV: Children use methods of mobility that require physical assistance or powered mobility in most settings. Children require adaptive seating for trunk and pelvic control and physical assistance for most transfers. At home, children use floor mobility (roll, creep, or crawl), walk short distances with physical assistance, or use powered mobility. When positioned, children may use a body support walker at home or school. At school, outdoors, and in the community, children are transported in a manual wheelchair or use powered mobility. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports, including physical assistance and/or powered mobility.

Level V: Children are transported in a manual wheelchair in all settings. Children are limited in their ability to maintain antigravity head and trunk postures and control arm and leg movements. Assistive technology is used to improve head alignment, seating, standing, and and/or mobility but limitations are not fully compensated by equipment. Transfers require complete physical assistance of an adult. At home, children may move short distances on the floor or may be carried by an adult. Children may achieve self-mobility using powered mobility with extensive adaptations for seating and control access. Limitations in mobility necessitate adaptations to enable participation in physical activities and sports including physical assistance and using powered mobility.

36

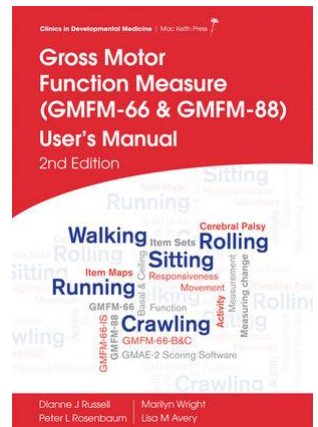
GMFM-66 Percentiles by Age
GMFCS Level II

Age	Percentile	Percentile																				
		3	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	97
2 years	0 mo	36.8	37.9	39.7	41.0	42.0	43.0	43.9	44.7	45.5	46.3	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2
	3 mo	37.5	38.6	40.5	41.8	42.9	43.9	44.7	45.5	46.3	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2	
	6 mo	38.2	39.4	41.3	42.6	43.7	44.7	45.5	46.3	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2		
	9 mo	39.0	40.2	42.1	43.5	44.4	45.5	46.3	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2			
3 years	0 mo	39.7	40.9	42.9	44.3	45.2	46.3	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2				
	3 mo	40.4	41.7	43.7	45.1	46.0	47.0	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2					
	6 mo	41.2	42.5	44.5	45.9	46.8	47.8	48.8	49.7	50.7	51.8	53.1	54.7	56.7	60.0	62.2						
	9 mo	41.9	43.2	45.3	46.7	47.6	48.6	49.6	50.6	51.6	52.6	53.6	54.6	55.6	56.6	57.6	58.6	59.6	60.6	61.6	62.6	
4 years	0 mo	42.5	43.9	46.1	47.4	48.3	49.3	50.3	51.3	52.3	53.3	54.3	55.3	56.3	57.3	58.3	59.3	60.3	61.3	62.3		
	3 mo	43.1	44.6	46.8	48.1	49.0	50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0			
	6 mo	43.7	45.2	47.5	48.8	49.7	50.7	51.7	52.7	53.7	54.7	55.7	56.7	57.7	58.7	59.7	60.7	61.7	62.7			
	9 mo	44.2	45.8	48.1	49.5	50.4	51.4	52.4	53.4	54.4	55.4	56.4	57.4	58.4	59.4	60.4	61.4	62.4				
5 years	0 mo	44.8	46.3	48.8	50.4	51.3	52.3	53.3	54.3	55.3	56.3	57.3	58.3	59.3	60.3	61.3	62.3					
	3 mo	45.3	46.9	49.4	51.1	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0						
	6 mo	45.8	47.5	50.1	51.8	52.7	53.7	54.7	55.7	56.7	57.7	58.7	59.7	60.7	61.7	62.7						
	9 mo	46.4	48.1	50.7	52.5	53.4	54.4	55.4	56.4	57.4	58.4	59.4	60.4	61.4	62.4							
6 years	0 mo	46.9	48.7	51.4	53.3	54.2	55.2	56.2	57.2	58.2	59.2	60.2	61.2	62.2								
	3 mo	47.5	49.3	52.1	54.0	54.9	55.9	56.9	57.9	58.9	59.9	60.9	61.9	62.9								
	6 mo	48.1	49.9	52.8	54.7	55.6	56.6	57.6	58.6	59.6	60.6	61.6	62.6									
	9 mo	48.7	50.5	53.4	55.3	56.2	57.2	58.2	59.2	60.2	61.2	62.2										
7 years	0 mo	49.2	51.1	54.0	56.0	56.9	57.9	58.9	59.9	60.9	61.9	62.9										
	3 mo	49.7	51.6	54.5	56.5	57.4	58.4	59.4	60.4	61.4	62.4											
	6 mo	50.2	52.1	55.0	57.0	57.9	58.9	59.9	60.9	61.9	62.9											
	9 mo	50.7	52.6	55.5	57.5	58.4	59.4	60.4	61.4	62.4												
8 years	0 mo	51.2	53.1	56.0	58.0	58.9	59.9	60.9	61.9	62.9												
	3 mo	51.7	53.6	56.5	58.5	59.4	60.4	61.4	62.4													
	6 mo	52.0	53.9	56.8	58.8	59.7	60.7	61.7	62.7													
	9 mo	52.4	54.3	57.2	59.2	60.1	61.1	62.1														
9 years	0 mo	52.9	54.7	57.6	59.6	60.5	61.5	62.5														
	3 mo	53.4	55.3	58.2	60.2	61.1	62.1															
	6 mo	53.8	55.7	58.6	60.6	61.5	62.5															
	9 mo	54.2	56.1	59.0	61.0	61.9	62.9															

50 isn't even on the chart!!!

GMFM (the test)

- You need the manual
- You need a score sheet



GMFM (the test)

- Pick a version (66 vs 88) (basal and ceiling) (item sets)
- Can you download the software? (Gross Motor Ability Estimator (GMAE-2) Scoring Software for the GMFM)
- Print the percentile charts

41

Scoring

SCORING KEY

- 0 = does not initiate
- 1 = initiates
- 2 = partially completes
- 3 = completes
- NT = Not tested [used for the GMAE scoring*]

42

A: LYING & ROLLING

1. SUP, HEAD IN MIDLINE: TURNS HEAD WITH EXTREMITIES SYMMETRICAL.....
2. SUP: BRINGS HANDS TO MIDLINE, FINGERS ONE WITH THE OTHER
3. SUP: LIFTS HEAD 45°
4. SUP: FLEXES R HIP AND KNEE THROUGH FULL RANGE
5. SUP: FLEXES L HIP AND KNEE THROUGH FULL RANGE
6. SUP: REACHES OUT WITH R ARM, HAND CROSSES MIDLINE TOWARD TOY
7. SUP: REACHES OUT WITH L ARM, HAND CROSSES MIDLINE TOWARD TOY.....

43

How do you score it?

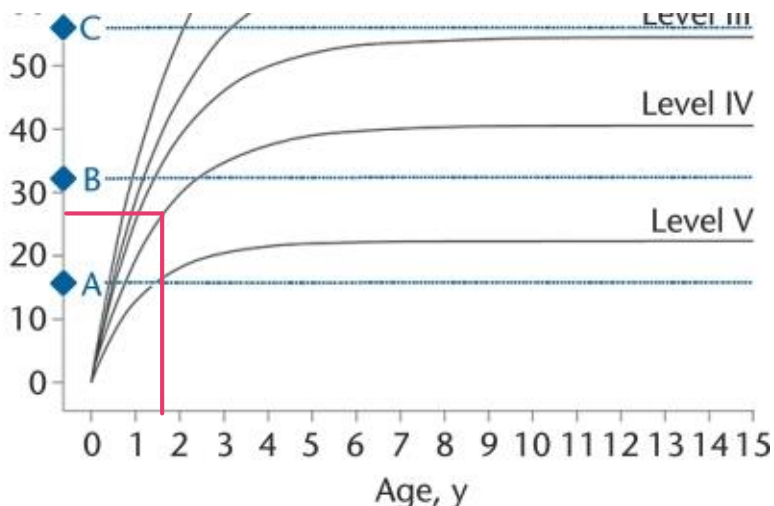
DIMENSION	CALCULATION OF DIMENSION % SCORES	GOAL AREA (indicated with <input checked="" type="checkbox"/>)
A. Lying & Rolling	$\frac{\text{Total Dimension A}}{51} = \frac{\quad}{51} \times 100 = \quad\% $	A. <input type="checkbox"/>
B. Sitting	$\frac{\text{Total Dimension B}}{60} = \frac{\quad}{60} \times 100 = \quad\% $	B. <input type="checkbox"/>
C. Crawling & Kneeling	$\frac{\text{Total Dimension C}}{42} = \frac{\quad}{42} \times 100 = \quad\% $	C. <input type="checkbox"/>
D. Standing	$\frac{\text{Total Dimension D}}{39} = \frac{\quad}{39} \times 100 = \quad\% $	D. <input type="checkbox"/>
E. Walking, Running & Jumping	$\frac{\text{Total Dimension E}}{72} = \frac{\quad}{72} \times 100 = \quad\% $	E. <input type="checkbox"/>
<p>TOTAL SCORE = $\frac{\%A + \%B + \%C + \%D + \%E}{\text{Total \# of Dimensions}}$</p> <p>= $\frac{\quad + \quad + \quad + \quad + \quad}{5} = \frac{\quad}{5} = \quad\%$</p>		
<p>GOAL TOTAL SCORE = $\frac{\text{Sum of \% scores for each dimension identified as a goal area}}{\text{\# of Goal areas}}$</p> <p>= $\frac{\quad}{\quad} = \quad\%$</p>		

44

DIMENSION	CALCULATION OF DIMENSION % SCORES		
A. Lying & Rolling	$\frac{\text{Total Dimension A}}{51}$	$= \frac{\quad}{51}$	$\times 100 = \quad\% \quad$
B. Sitting	$\frac{\text{Total Dimension B}}{60}$	$= \frac{\quad}{60}$	$\times 100 = \quad\% \quad$
C. Crawling & Kneeling	$\frac{\text{Total Dimension C}}{42}$	$= \frac{\quad}{42}$	$\times 100 = \quad\% \quad$
D. Standing	$\frac{\text{Total Dimension D}}{39}$	$= \frac{\quad}{39}$	$\times 100 = \quad\% \quad$
E. Walking, Running & Jumping	$\frac{\text{Total Dimension E}}{72}$	$= \frac{\quad}{72}$	$\times 100 = \quad\% \quad$
TOTAL SCORE =	$\frac{\%A + \%B + \%C + \%D + \%E}{\text{Total \# of Dimensions}}$		

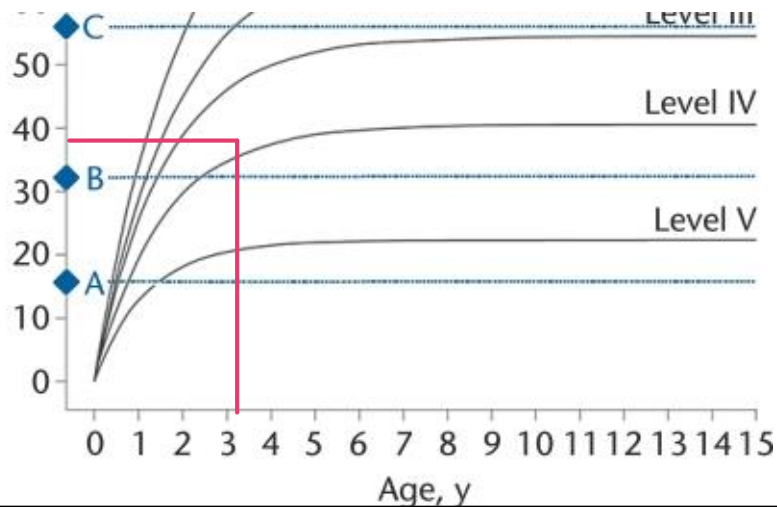
45

Alice at 18 mos
 Score = A:42, B:20, C:3, D:0, E:0
 $90\% + 33\% + 7\% + 0\% + 0\% / 5 = 26\%$



46

Alice at 37 mos
 Score = A:51, B:38, C:13, D:0, E:0
 $100\%+63\%+31\%+0\%+0\%/5= 39\%$



47

Score +39%

GMFMS-66 Percentiles by Age

GMFCS Level IV

Age	Percentile																					
	3	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	97	
2 years	0 mo	21.2	23.1	25.7	27.4	28.6	29.6	30.4	31.2	31.9	32.6	33.3	33.9	34.6	35.2	35.9	36.6	37.3	38.2	39.3	40.8	41.7
	3 mo	21.2	23.2	25.9	27.5	28.7	29.7	30.6	31.4	32.1	32.8	33.5	34.1	34.7	35.4	36.1	36.8	37.5	38.4	39.5	41.0	42.0
	6 mo	21.7	23.7	26.5	28.2	29.4	30.5	31.4	32.2	33.0	33.7	34.3	35.0	35.7	36.3	37.0	37.8	38.5	39.5	40.6	42.1	43.1
	9 mo	22.1	24.2	27.1	28.8	30.2	31.2	32.2	33.0	33.8	34.5	35.2	35.9	36.6	37.3	38.0	38.7	39.6	40.5	41.6	43.2	44.2
3 years	0 mo	22.4	24.7	27.7	29.5	30.9	32.0	32.9	33.8	34.6	35.4	36.1	36.8	37.5	38.2	38.9	39.7	40.5	41.5	42.7	44.3	45.4
	3 mo	22.8	25.1	28.2	30.1	31.5	32.7	33.7	34.6	35.4	36.2	36.9	37.7	38.4	39.1	39.9	40.7	41.5	42.5	43.7	45.4	46.5
	6 mo	23.2	25.5	28.8	30.7	32.2	33.4	34.4	35.3	36.2	37.0	37.7	38.5	39.2	40.0	40.7	41.5	42.4	43.4	44.6	46.4	47.5
	9 mo	23.5	25.9	29.3	31.3	32.8	34.0	35.1	36.0	36.9	37.7	38.5	39.2	40.0	40.7	41.5	42.4	43.3	44.3	45.5	47.3	48.4
4 years	0 mo	23.8	26.3	29.7	31.8	33.3	34.6	35.7	36.6	37.5	38.3	39.1	39.9	40.7	41.5	42.3	43.1	44.0	45.1	46.3	48.2	49.3
	3 mo	24.0	26.7	30.2	32.3	33.8	35.1	36.2	37.2	38.1	38.9	39.8	40.5	41.3	42.1	42.9	43.8	44.7	45.8	47.1	48.9	50.1
	6 mo	24.3	27.0	30.6	32.7	34.3	35.6	36.7	37.7	38.6	39.5	40.3	41.1	41.9	42.7	43.5	44.4	45.4	46.4	47.8	49.6	50.8
	9 mo	24.5	27.3	30.9	33.1	34.7	36.0	37.2	38.2	39.1	40.0	40.8	41.6	42.4	43.3	44.1	45.0	45.9	47.0	48.4	50.2	51.4

48

GMFM-66 Percentiles by Age

GMFCS Level III

Level 3 Percentiles

Score=39%

Age		Percentile										
		3	5	10	15	20	25	30	35	40	45	50
2 years	0 mo	37.0	38.2	40.0	41.1	42.1	42.8	43.5	44.1	44.7	45.3	45.8
	3 mo	37.1	38.4	40.2	41.3	42.3	43.1	43.8	44.4	45.0	45.6	46.1
	6 mo	37.4	38.6	40.5	41.7	42.6	43.4	44.2	44.8	45.4	46.0	46.6
	9 mo	37.6	38.8	40.7	42.0	43.0	43.8	44.5	45.2	45.9	46.5	47.1
3 years	0 mo	37.8	39.1	41.0	42.3	43.3	44.2	44.9	45.6	46.3	46.9	47.5
	3 mo	37.9	39.3	41.3	42.6	43.7	44.5	45.3	46.0	46.7	47.4	48.0
	6 mo	38.1	39.5	41.6	42.9	44.0	44.9	45.7	46.4	47.1	47.8	48.5
	9 mo	38.3	39.7	41.8	43.2	44.3	45.3	46.1	46.8	47.6	48.2	48.9

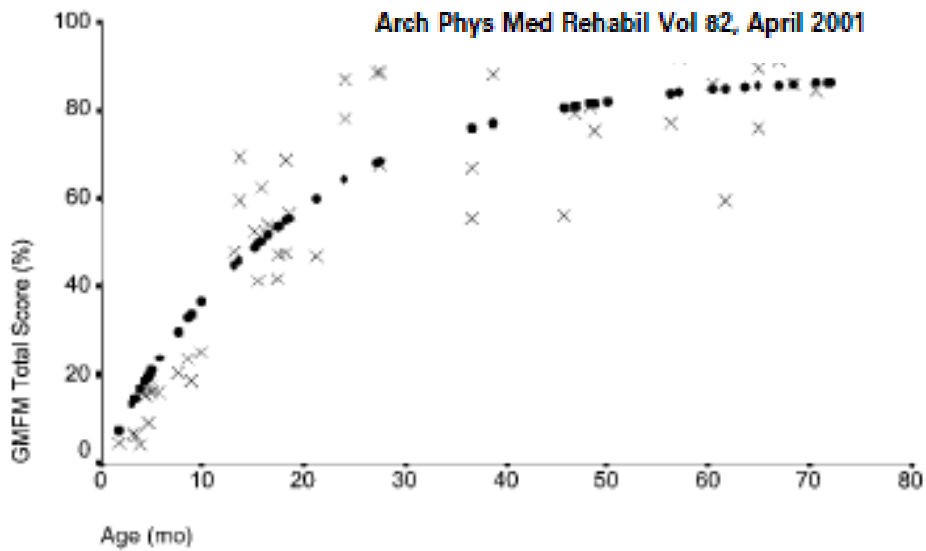
49

Down Syndrome

- ▶ 88
- ▶ 2 curves

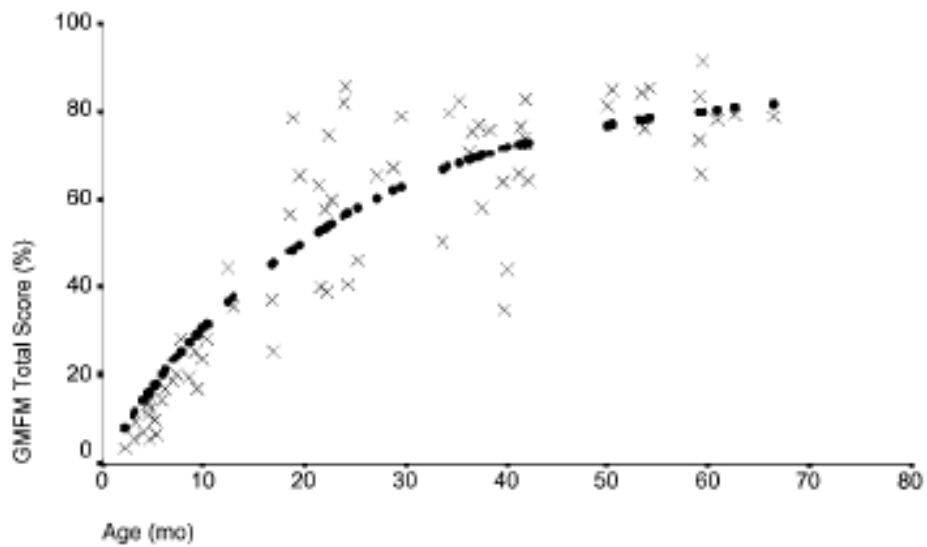
50

MILD DS CURVE



51

MOD/SEVERE DOWN SYNDROME CURVE



52

Need Stuff?

- Ginny@paleg.com