Disability Evaluation (Locomotor Disability)

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SVNIRTAR
पुनर्वास सेवा भवन
REHABILITATION SERVICES BUILDING

NATIONAL INSTITUTE FOR LOCOMOTOR DISABILITIES (DIVYANGJAN)

राष्ट्रीय गतिशील दिव्यांगजन संस्थान

Department of Empowerment of Persons with Disabilities(Divyangjan),
Ministry of Social Justice and Empowerment, Govt. of India
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Dr. S.P. Das
Director (Offg)

Definition

- “Locomotor disability” means a person’s inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both.

Disabled Population by Type of Disability India : 2011

Disabled Population by Type of Disability India : 2011			
Total	**26,810,557**	**14,986,202**	**11,824,355**
In Seeing	5,032,463	2,638,516	2,393,947
In Hearing	5,071,007	2,677,544	2,393,463
In Speech	1,998,535	1,122,896	875,639
In Movement	5,436,604	3,370,374	2,066,230
Mental Retardation	1,505,624	870,708	634,916
Mental Illness	722,826	415,732	307,094
Any Other	4,927,011	2,727,828	2,199,183
Multiple Disability	2,116,487	1,162,604	953,883

Source: C-Series, Table C-20, Census of India 2011

PWD Act 1995

- Blindness
- Low vision
- Leprosy-cured
- Hearing impairment
- Loco motor disability
- Mental retardation
- Mental illness;

CATEGORIES

1. Blindness
2. Low-vision
3. Leprosy Cured persons
4. Hearing Impairment (deaf and hard of hearing)
5. Locomotor Disability
6. Dwarfism
7. Intellectual Disability
8. Mental Illness
9. Autism Spectrum Disorder
10. Cerebral Palsy
11. Muscular Dystrophy
12. Chronic Neurological conditions
13. Specific Learning Disabilities
14. Multiple Sclerosis
15. Speech and Language disability
16. Thalassemia
17. Hemophilia
18. Sickle Cell disease
19. Multiple Disabilities including deaf blindness
20. Acid Attack victim
21. Parkinson's disease

GROUPS

- A- EXTREMITIES(UPPER/LOWER)
- B-SPINE
- C-AMPUTATIONS
- D-CLUB FOOT AND OTHER CONDITIONS
- E-CHRONIC NEUROLOGICAL CONDITIONS
- F-SPINAL CORD INJURIES
- G-ACID ATTACK VICTIMS
- H-CEREBRAL PALSY
- I-LEPROSY CURED WITH DISABILITIES
- J-DWARFISM
- K-MUSCULAR DYSTROPHY
- Multiple sclerosis
- Parkinson’s Disease

BOARD

- **Medical superintendent/CMO/ Civil surgeon**
- **PMR /Orthopaedics Specialist**
- **One Specialist as nominated by CMO as per condition**

Items required

- **Measuring tape**
- **Goniometer**
- **Hand held Dynamometer**
- **Clean cotton piece**
- **Ball point pain**
- **X- ray films**

FORMULA

$$A+ \quad \frac{B \times (90-A)}{90} \quad \ldots\ldots\ldots\ldots$$

A-UPPER EXTREMITY

- **ARM COMPONENT**
- **HAND COMPONENT**

TOTAL COMPONENT

- **COMBINATION OF BOTH COMPONENTS**
- **TOTAL DISABILITY DOES NOT EXCEED 100%**
- **DISABILITY IS ALWAYS A WHOLE NUMBER NOT FRACTION**
- **SPECIFIC TO THAT EXTREMITY**

ARM COMPONENT COMPONENT-90%

- ROM
- MUSCLE STRENGTH
- COORDINATED ACTIVITY

HAND-90%

- PREHENSION-30%
- SENSATION-30%
- STRENGTH-30%

ROM- CHANGE

- **PREVIOUSLY 30 % EACH JOINT**
- **NOW**
- **SHOULDR-20, ELBOW-20, WRIST-10 AND HAND -40%**

UPPER LIMB- ADDITIONAL WEIGHTAGE

- SHORTENING
- DEFORMITY
- PAIN
- LOSS OF SENSATION
- COMPLICATION

MUSCLE STRENGTH

- **MUSCLE POWER – BY MRC LONDON – (1-5)**
- **MEAN PERCENTAGE – MULTIPLIED BY .30**

HAND COMPONENT

- **PREHENSION- 30%**
- **SENSATION-30%**
- **STRENGTH-30%**

A-LOWER EXTREMITY-90%

ADDITIONAL WEIGHT

- MOBILITY- ROM-30%
- STABILITY-30%
- STRENGTH=30%

- SHORTENING
- DEFORMITY
- PAIN
- LOSS OF SENSATION
- COMPLICATIONS


SHARATH
67874


07/03/2014 11:54

B- SPINE

- TRAUMATIC
- NON TRAUMATIC- DEFORMITY

TRAUMATIC

- CERVICAL SPINE
- CERVICAL DISC LESION
- THORACIC AND THORACOLUMBAR SPINE
- LUMBAR AND LUMBO SACRAL
- INTERVERTEBRAL DISC LESION

NON TRAUMATIC

- SCOLIOSIS
- KYPHOSCOLIOSIS
- KYPHOSIS

HANGMAN'S FRACTURE

A-Z of Emergency Radiology 1st ed. 2004


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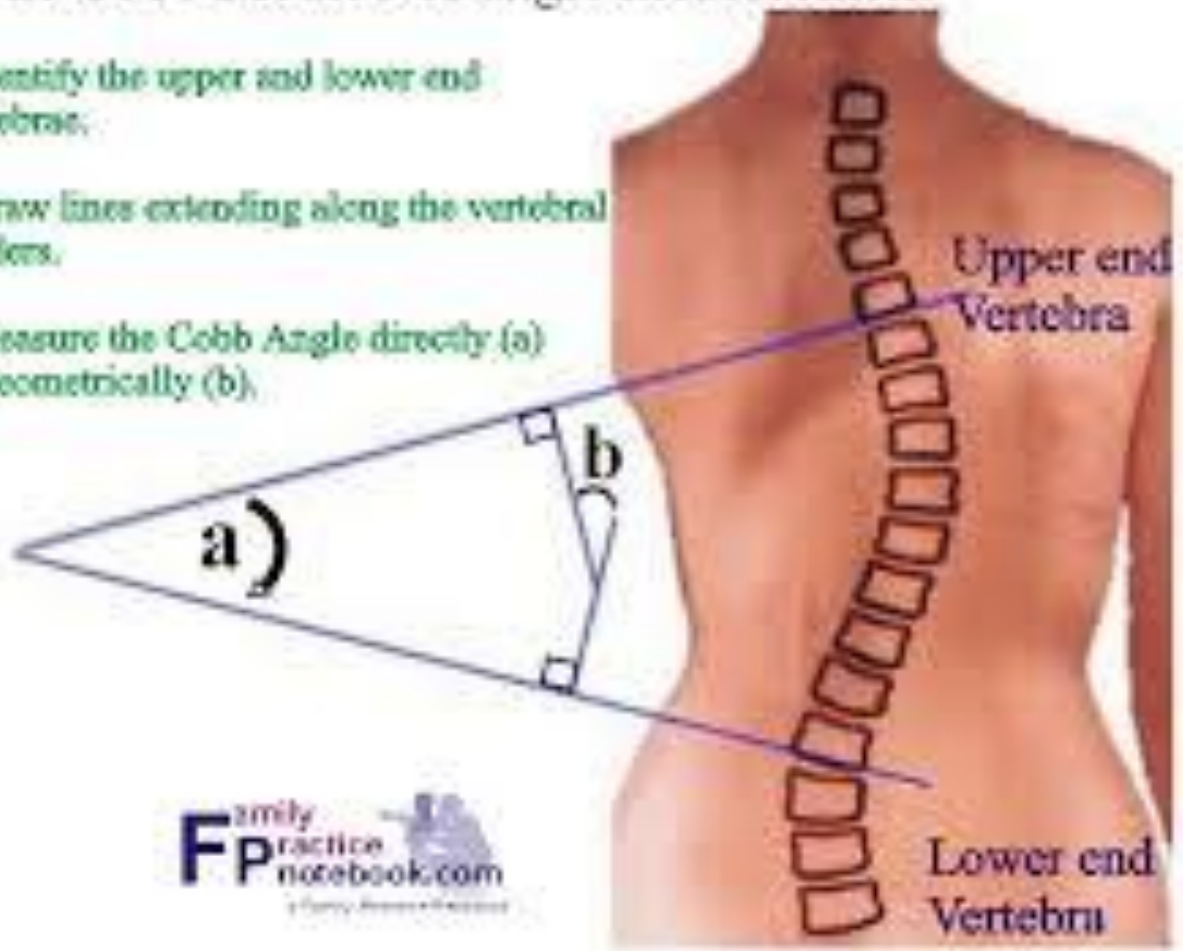
Scoliosis Radiographs

The Cobb Method of angle measurement

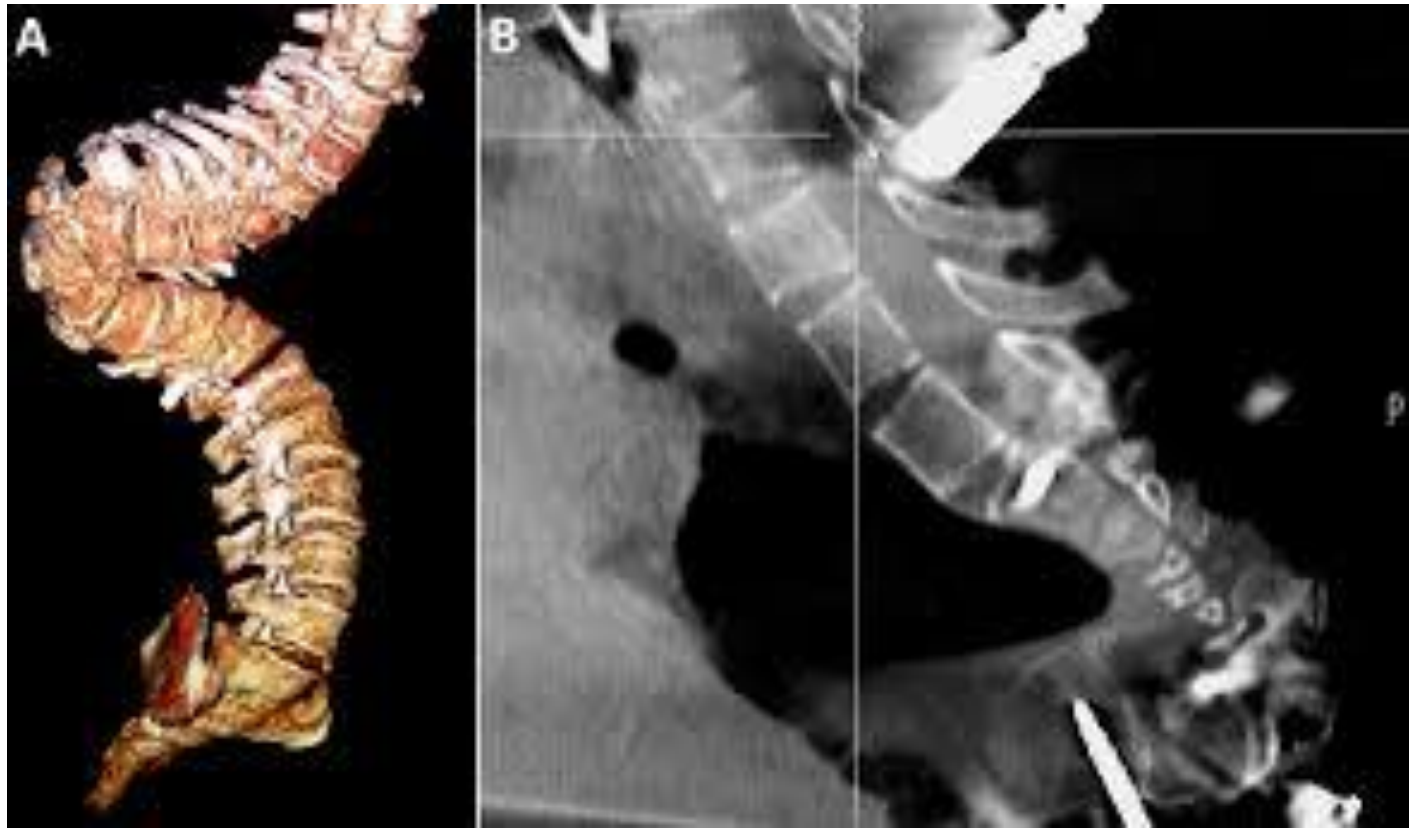
1. Identify the upper and lower end vertebrae.

2. Draw lines extending along the vertebral borders.

3. Measure the Cobb Angle directly (a) or geometrically (b).



KYPHOSIS



TORSO IMBALANCE

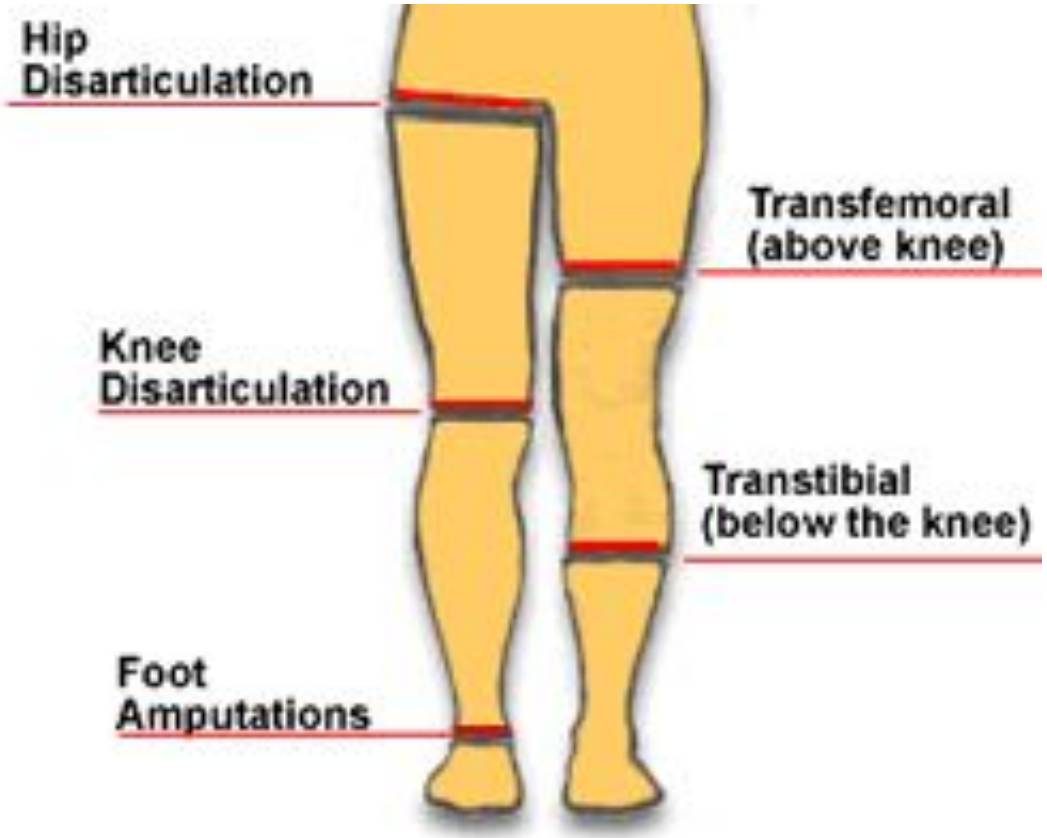
ADDITIONAL WEIGHTAGE(SPINE)

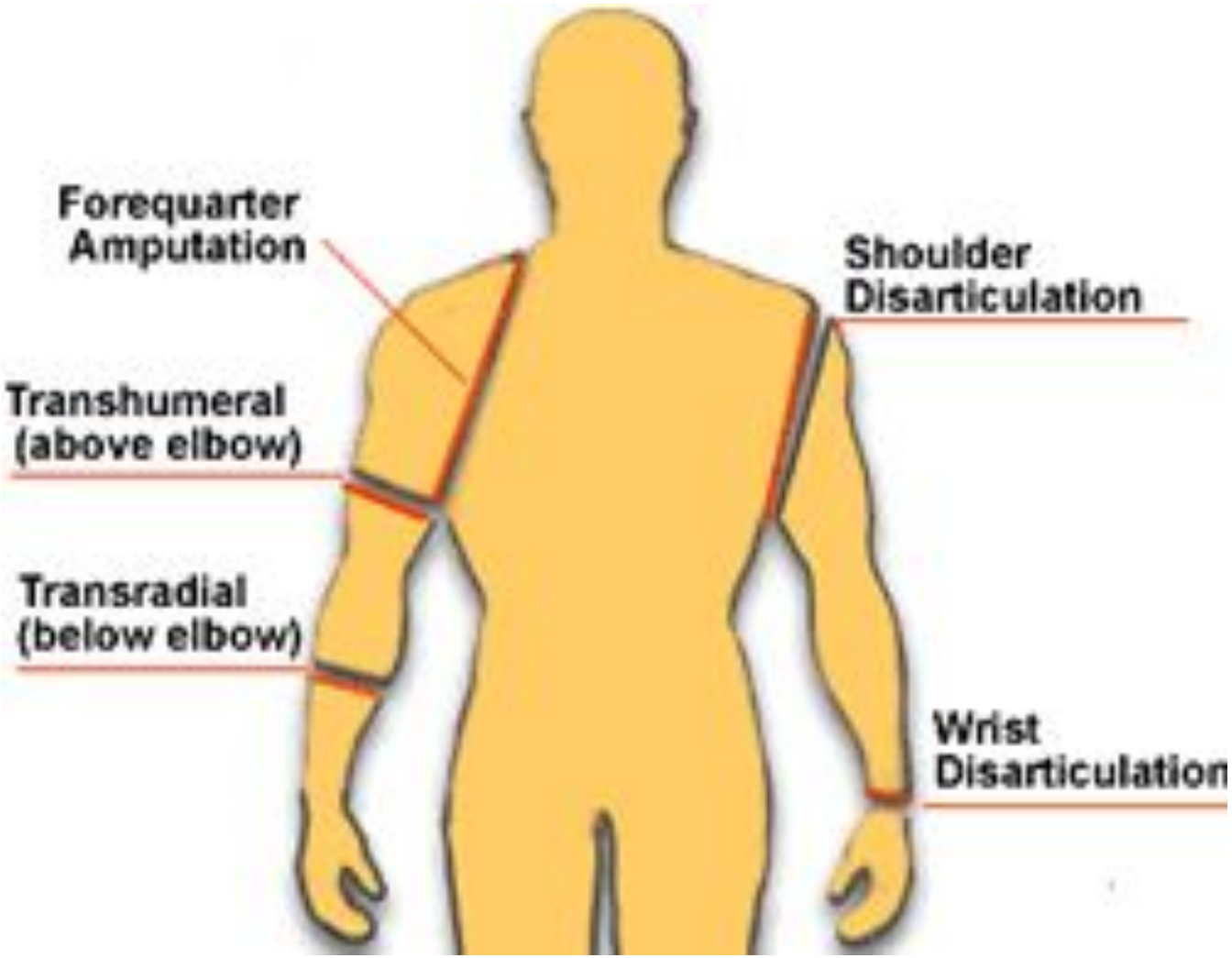
- CHEST EXPANSION
- COUNTING OF BREATH
- TORSO IMBALANCE
- PAIN
- COSMETIC APPEARANCE
- LEG LENGTH DISCREPANCY
- NEUROLOGICAL DEFICIT

C- AMPUTATION

- ACQUIRED
- CONGENITAL

Amputation Level





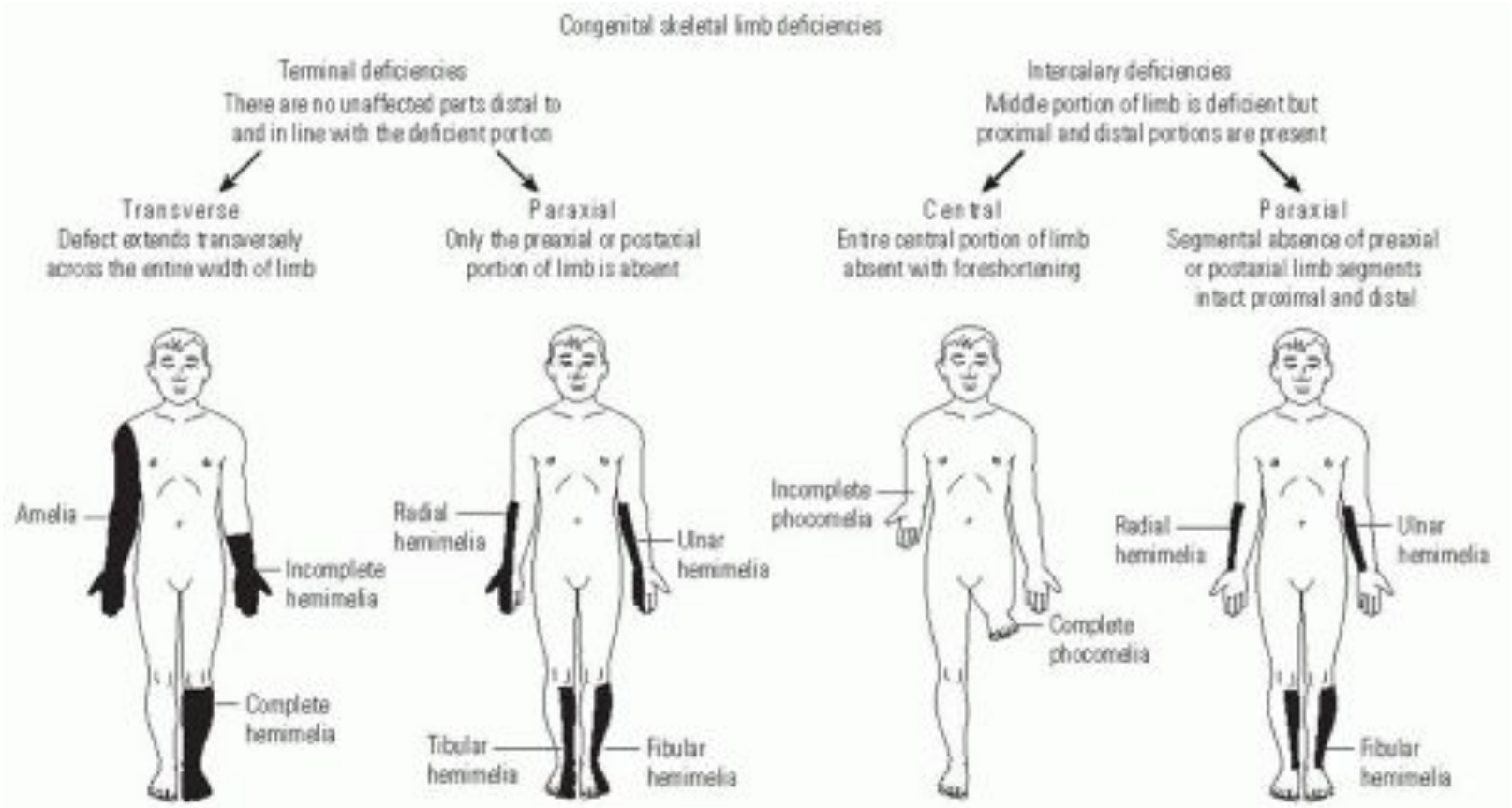
ADDITIONAL WEIGHTAGE

- UNFIT STUMP
- COMPLICATED STUMP- NEUROMA ETC.
- DOMINANT UPPER LIMB-10%

AMPUTATION (EASY)

- 1. Fore-quarter amputation 100
- 2. Shoulder Disarticulation 90
- 3. Trans Humeral (Above Elbow) upto upper 1/3 of arm 85
- 4. Trans Humeral (Above Elbow) upto lower 1/3 of arm 80
- 5. Elbow disarticulation 75
- 6. Trans Radial (Below Elbow) upto upper 1/3 of forearm 70
- 7. Trans Radial (Below Elbow) upto lower 1/3 of forearm 65
- 8. Wrist disarticulation 60
- 9. Hand through carpal bones 55
- 10. Thumb through C.M. or though 1st MC joint 30
- 11. Thumb disarticulation through metacarpophalangeal Joint or through proximal phalanx 25
- 12. Thumb disarticulation through inter phalangeal joint or Through distal phalanx 15
- 13. Amputation through Proximal phalanx or Disarticulation through MP joint of Index finger Middle finger Ring finger Little finger 15 5 3 2
- 14. Amputation through Middle phalanx or Disarticulation through PIP joint of Index finger Middle finger Ring finger Little finger 10 4 2 1
- 15. Amputation through Distal phalanx or disarticulation through DIP joint of Index finger Middle finger Ring finger Little finger 5

CONGENITAL (ISPO CLASSIFICATION)



TRANSVERSE

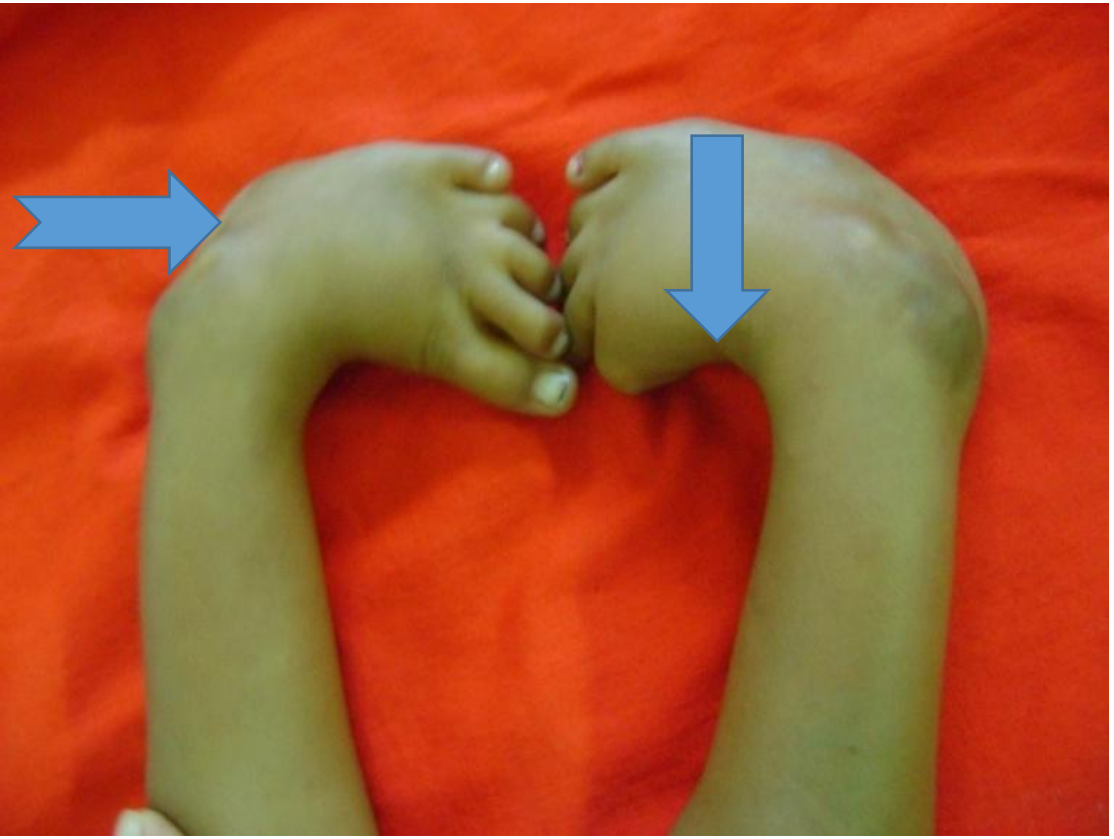
LONGITUDINAL

- FUNCTIONAL
- ROM, MUSCLE STRENGTH, PREHENSION
- SHORTENING
- STABILITY
- MOBILITY

CSLD

D- CLUB FOOT AND OTHERS

- CLUB FOOT – PIRANI SCORE- HIND FOOT+MID FOOT SCORE
- LYMPHODEMA- INTERLIMB DISCREPANCY
- CHARCOTS JOINT- Lee C. Roger’s classification- Location and stage



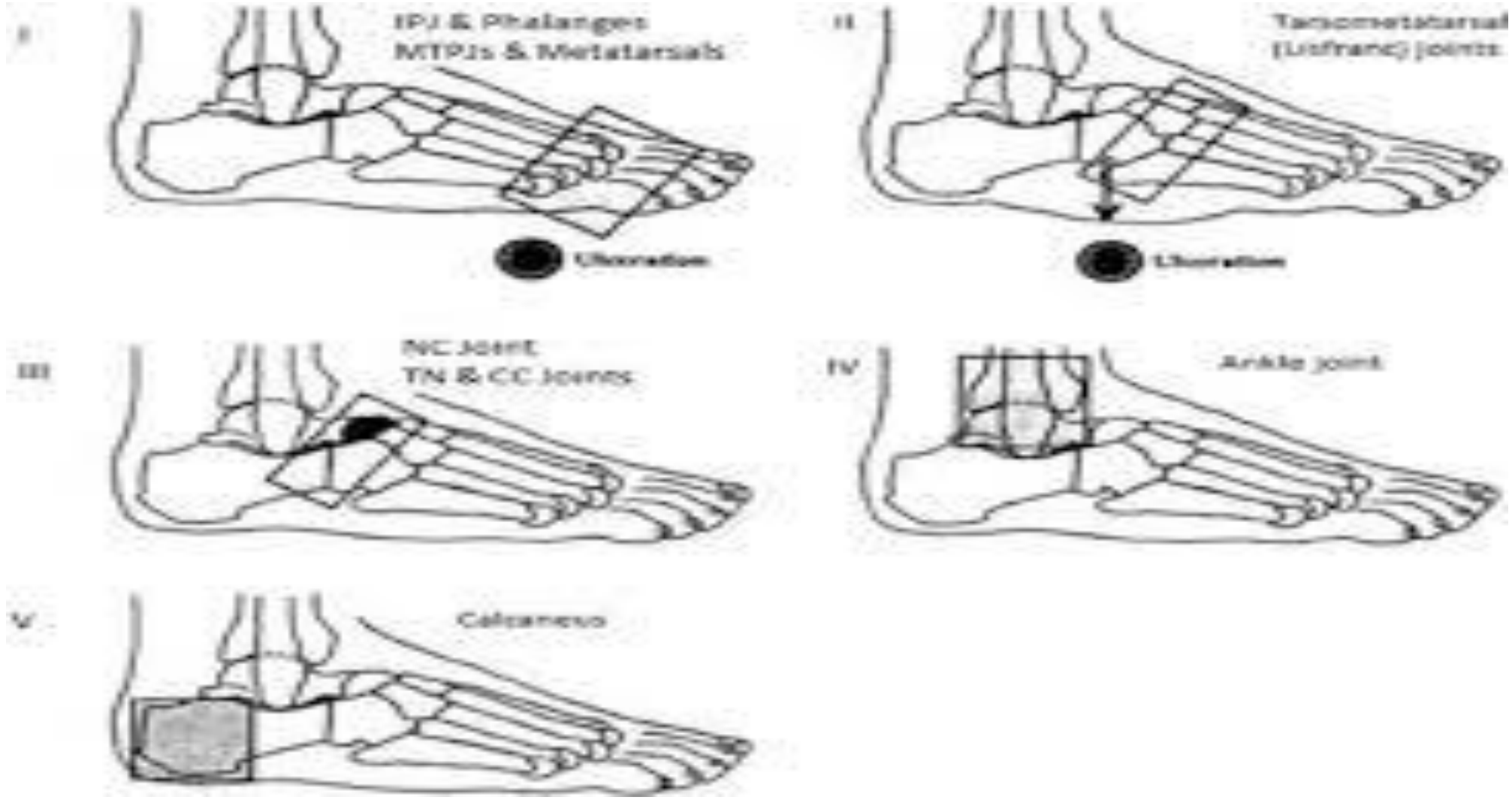
Pirani Score

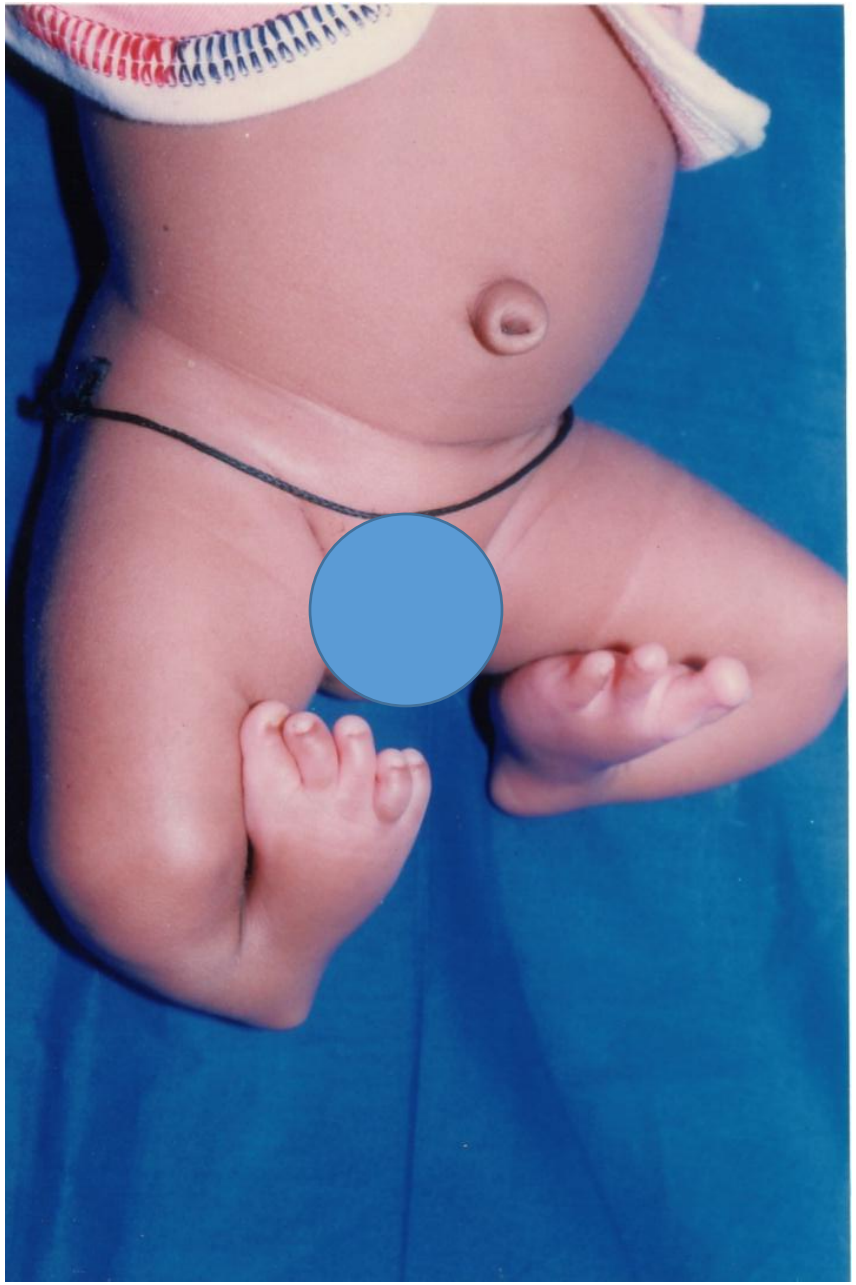
Parameters	Mild	Moderate	Severe
Midfoot			
Curved lateral border	0	0.5	1
Medial foot crease	0	0.5	1
Talar head coverage	0	0.5	1
Hindfoot			
Posterior crease	0	0.5	1
Rigid equinus	0	0.5	1
Empty heel	0	0.5	1

Maximum score is 6; Minimum score is 0. Higher the score, the more severe the deformity.


D

Lee C. Roger's classification-





MERMAID

E-CHRONIC NEUROLOGICAL CONDITIONS

- CENTRAL AND OTHER UPPER MOTOR LESIONS (ONLY)- STROKE/HEAD INJURY, BRAIN TUMOR RELATED, ENCEPHALITIS RELATED
- LOWER MOTOR NEURON LESION, MUSCULAR LESION- ALREADY DESCRIBED
- MINIMUM SIX MONTH AFTER DISEASE ONSET
- ADDITIONAL WEIGHTAGE FOR DOMINANCE AND SENSATION

STROKE

- MODIFIED RANKING SCALE (mRS) DEPENDS UPON
- Degree of Disability
- Dependence in the daily activities

0- NIL

1-<40%

5- >80%

Modified Ranking scale

Score	Description
0	No symptoms at all
1	No significant disability despite having symptoms; able to carry out all usual duties and activities
2	Slight disability; unable to carry out all previous activities, but able to look after own affairs without assistance
3	Moderate disability; requiring some help, but able to walk without assistance
4	Moderately severe disability; unable to walk without assistance, and unable to attend own bodily needs without assistance
5	Severe disability; bedridden, incontinent, and requiring constant nursing care and attention
6	Dead

OTHER NEUROLOGICAL DISABILITY

- EXTENT OF SENSORY DEFICIT
- BLADDER DISABILITY
- ATAXIA (SENSORY AND CEREBELLAR)

F- SPINAL CORD INJURIES (EASY)

- QUADRIPLEGIA- 90%
- PARAPLEGIA- 75%
- CAUDA EQUINA +BOWEL BLADDER- 60%
- CAUDA EQUINA – BOWEL BLADDER- 40%

G-ACID ATTACK VICTIMS

- EXTENT OF DAMAGE IN AREA AND DEPTH
- SCALP, EYE BROW, EYE LID, EAR, NOSELIPS, CHEEK, NECK, BREAST, TRUNK, ABDOMEN, BUTTOCK, THIGH, LEG, ARM AND HAND
- MOUTH, ESOPHAGUS, RESPIRATORY TRACT
- ADDITIONAL WEIGHTAGE TO GENDER, AGE, OCCUPATION

H-CEREBRAL PALSY (EASY)

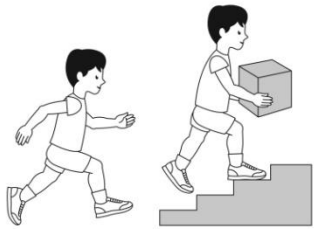
- **GMFCS-** GROSS MOTOR FUNCTIONAL CLASIFICATION SYSTEM
- **MACS-** MANUAL ABILITY CLASSIFICATION SYSTEM

Natural History

Walkers

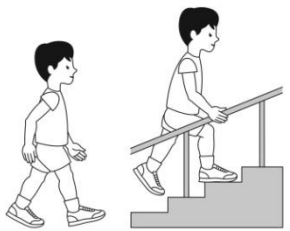
Non-walkers

GMFCS E & R between 6th and 12th birthday: Descriptors and illustrations



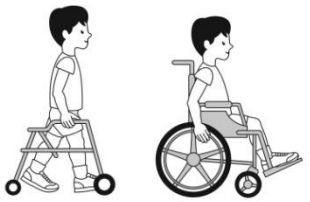
GMFCS Level I

Children walk at home, school, outdoors and in the community. They can climb stairs without the use of a railing. Children perform gross motor skills such as running and jumping, but speed, balance and coordination are limited



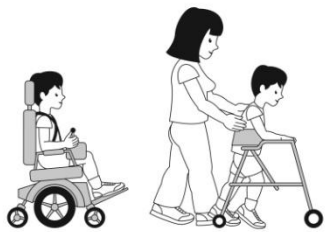
GMFCS Level II

Children walk in most settings and climb stairs holding onto a railing. They may experience difficulty walking long distances and balancing on uneven terrain, inclines, in crowded areas or confined spaces. Children may walk with physical assistance, a hand-held mobility device or used wheeled mobility over long distances. Children have only minimal ability to perform gross motor skills such as running and jumping.



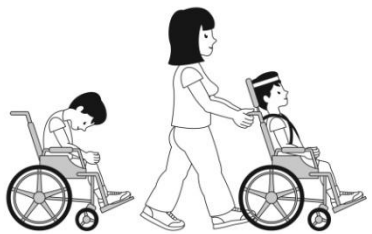
GMFCS Level III

Children walk using a hand-held mobility device in most indoor settings. They may climb stairs holding onto a railing with supervision or assistance. Children use wheeled mobility when traveling long distances and may self-propel for shorter distances.



GMFCS Level IV

Children use methods of mobility that require physical assistance or powered mobility in most settings. They may walk for short distances at home with physical assistance or use powered mobility or a body support walker when positioned. At school, outdoors and in the community children are transported in a manual wheelchair or use powered mobility.

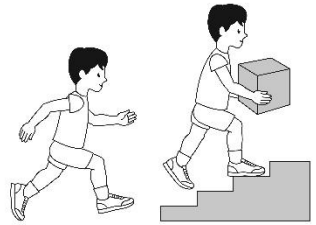


GMFCS Level V

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 leg and arm movements.

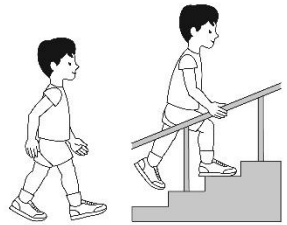
GMFCS descriptors: Palisano et al. (1997) Dev Med Child Neurol 39:214-23
CanChild: www.canchild.ca

GMFCS E & R between 6th and 12th birthday: Descriptors and illustrations



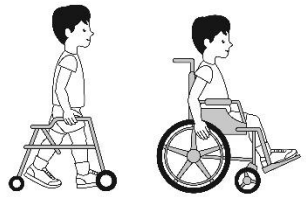
GMFCS Level I

Children walk at home, school, outdoors and in the community. They can climb stairs without the use of a railing. Children perform gross motor skills such as running and jumping, but speed, balance and coordination are limited



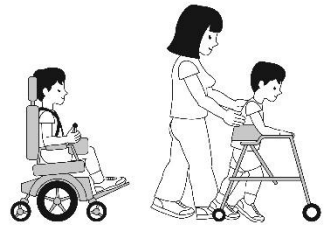
GMFCS Level II

Children walk in most settings and climb stairs holding onto a railing. They may experience difficulty walking long distances and balancing on uneven terrain, inclines, in crowded areas or confined spaces. Children may walk with physical assistance, a hand-held mobility device or used wheeled mobility over long distances. Children have only minimal ability to perform gross motor skills such as running and jumping.



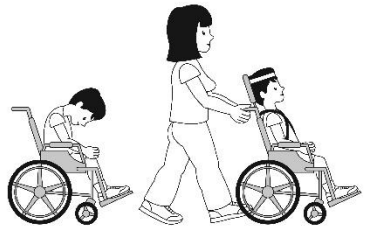
GMFCS Level III

Children walk using a hand-held mobility device in most indoor settings. They may climb stairs holding onto a railing with supervision or assistance. Children use wheeled mobility when traveling long distances and may self-propel for shorter distances.



GMFCS Level IV

Children use methods of mobility that require physical assistance or powered mobility in most settings. They may walk for short distances at home with physical assistance or use powered mobility or a body support walker when positioned. At school, outdoors and in the community children are transported in a manual wheelchair or use powered mobility.

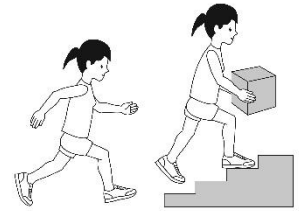


GMFCS Level V

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 leg and arm movements.

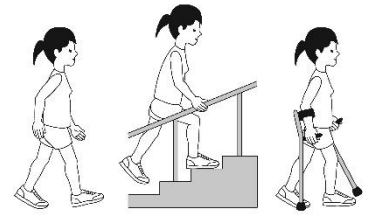
GMFCS descriptors: Palisano et al. (1997) Dev Med Child Neurol 39:214-23
CanChild: www.canchild.ca

GMFCS E & R between 12th and 18th birthday: Descriptors and illustrations



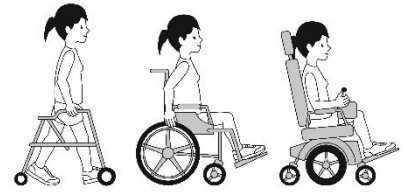
GMFCS Level I

Youth walk at home, school, outdoors and in the community. Youth are able to climb curbs and stairs without physical assistance or a railing. They perform gross motor skills such as running and jumping but speed, balance and coordination are limited.



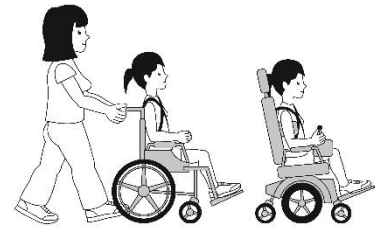
GMFCS Level II

Youth walk in most settings but environmental factors and personal choice influence mobility choices. At school or work they may require a hand held mobility device for safety and climb stairs holding onto a railing. Outdoors and in the community youth may use wheeled mobility when traveling long distances.



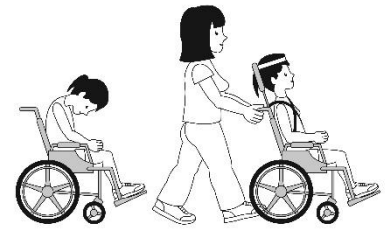
GMFCS Level III

Youth are capable of walking using a hand-held mobility device. Youth may climb stairs holding onto a railing with supervision or assistance. At school they may self-propel a manual wheelchair or use powered mobility. Outdoors and in the community youth are transported in a wheelchair or use powered mobility.



GMFCS Level IV

Youth use wheeled mobility in most settings. Physical assistance of 1-2 people is required for transfers. Indoors, youth may walk short distances with physical assistance, use wheeled mobility or a body support walker when positioned. They may operate a powered chair, otherwise are transported in a manual wheelchair.



GMFCS Level V

Youth are transported in a manual wheelchair in all settings. Youth are limited in their ability to maintain antigravity head and trunk postures and control leg and arm movements. Self-mobility is severely limited, even with the use of assistive technology.

GMFCS descriptors: Palisano et al. (1997) Dev Med Child Neurol 39:214-23
CanChild: www.canchild.ca

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GMFCS I,II

GMFCS III,IV.V

I-LEPROSY CURED (TESTS)

- SENSORY TESTING- TIP OF BALL POINT PEN
- CORNEAL SENSATION- COTTON WISP
- MUSCLE TESTING- MEDICAL RESEARCH COUNCIL GRADING(1-5)

LEPROSY CURED (WHO GRADING OF DISABILIITY)

- EYE- 0,1,2
- HAND- 0,1,2
- FEET- 0,1,2

- LOWEST SCORE- 2
- HIGHEST SCORE (BOTH SIDES)- 12
- EXAMPLE- EHF SCORE-2-20%
- EHF SCORE -12 (91-100%)

J-DWARFISM (EASY)

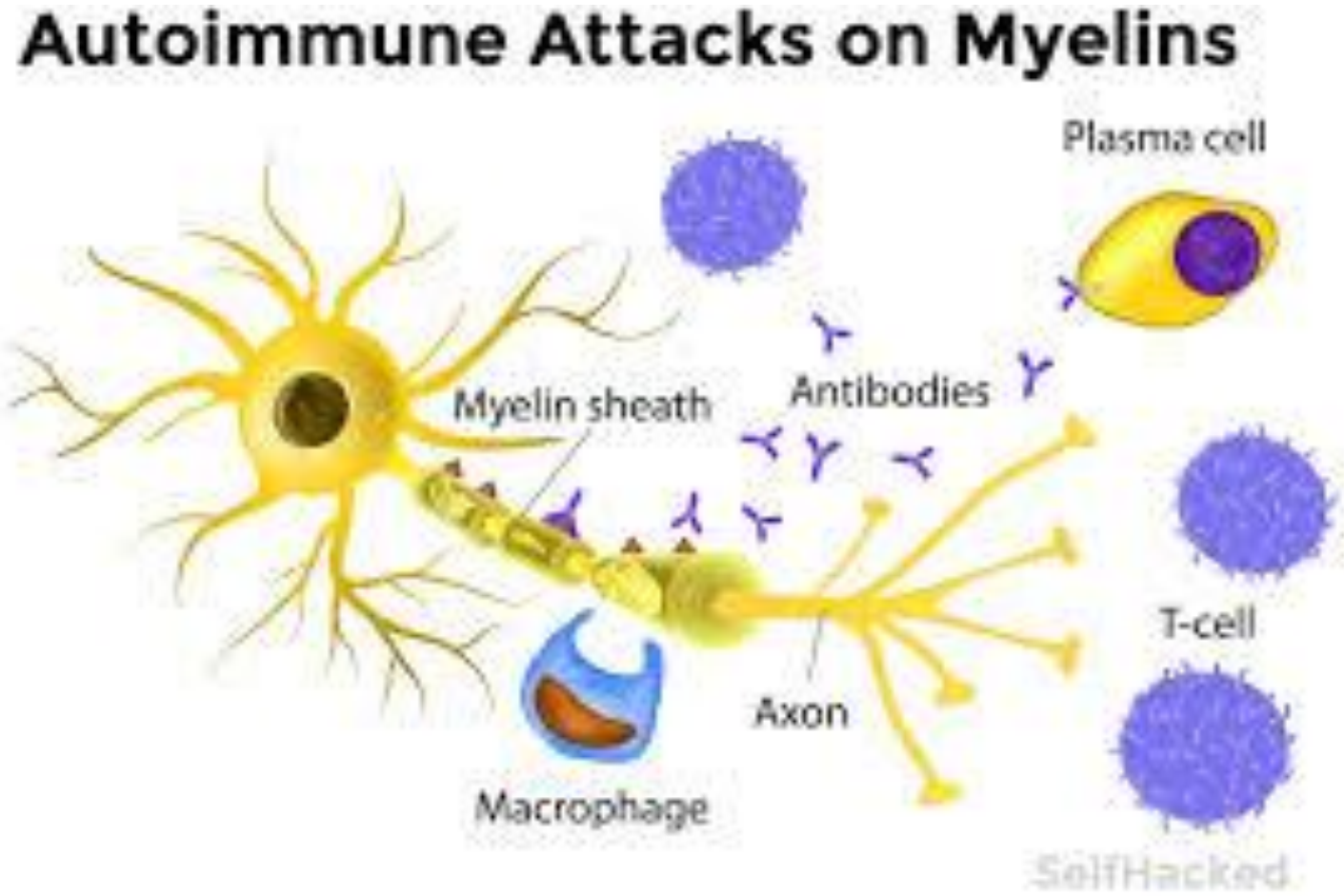
- ADULT HEIGHT OF 4 FEET AND 10 INCHES(145 cm or Less)
- Table format is there
- 4 feet 9 inches- 4%
- 2 feet 9 inches- 100%

STATURE ENHANCEMENT

K-MUSCULAR DYSTROPHY

- WEAKNESS
- DEFORMITY- ROM
- SCOLIOSIS
- CARDIAC FUNCTION
- PULMONARY FUNCTION
- PROGRESIVE DISEASE- 2 YEARLY REVIEW

MULTIPLE SCLEROSIS



MULTIPLE SCLEROSIS (Multiple Disability)

- **Numbness or weakness in one or more limbs that typically occurs on one side of your body at a time, or the legs and trunk**
- **Partial or complete loss of vision, usually in one eye at a time, often with pain during eye movement**
- **Prolonged double vision**
- **Tingling or pain in parts of your body**
- **Electric-shock sensations that occur with certain neck movements, especially bending the neck forward (Lhermitte sign)**
- **Tremor, lack of coordination or unsteady gait**
- **Slurred speech**
- **Fatigue**
- **Dizziness**
- **Problems with bowel and bladder function**

PARKINSON’S DISEASE(Multiple Disability)

- TREMOR
- STIFF MUSCLE
- RIGIDITY
- TROUBLE WALKING
- SPEECH PROBLEM
- DEMENTIA
- LOSS OF SMELL
- TROUBLE SLEEP
- CONSTIPATION
- LOW VOICE
- ANXIETY

FORMULA

$$A+ \quad \frac{B \times (90-A)}{90} \quad \ldots\ldots\ldots\ldots$$


Thank you