

I VISUAL FUNCTIONS**Visual Fields**

- 0 normal
- 1 signs only: patient unaware of deficit
- 2 moderate: patient aware but incomplete hemianopsia on exam
- 3 marked: complete homonymous hemianopsia or equivalent

Scotoma

- 0 none
- 1 small: patient unaware but detectable on confrontation testing
- 2 large: spontaneously reported by patient

Red Desaturation

- 0 not present
- 1 present

FUNCTIONAL SYSTEM SCORE:

- 0 normal
- 1 visual acuity (corrected) worse eye worse than 20/20 but better than 20/30 OR small scotoma
- 2 worse eye 20/30 to 20/59
- 3 worse eye 20/60 to 20/99 OR large scotoma OR moderate decrease in fields
- 4 worse eye 20/100 to 20/200 OR marked decrease in fields
- 5 worse eye corrected acuity worse than 20/200 OR grade 4 plus better eye 20/60 or less
- 6 grade 5 plus better eye 20/60 or less

II BRAINSTEM FUNCTIONS:**Extraocular Movement Impairment:**

- 0 none
- 1 signs only: subtle, barely detectable on exam; patient without blurred vision or diplopia
- 2 mild: grade 1 plus patient aware OR obvious incomplete paralysis of eye movement but patient not aware
- 3 moderate: obvious incomplete paralysis and patient aware OR complete loss of movement in one direction
- 4 marked: complete loss of movement in more than one direction

Nystagmus:

- 0 none
- 1 mild: gaze evoked, subtle
- 2 moderate: sustained on horizontal or vertical gaze but not in primary position
- 3 severe: sustained in primary position OR coarse direction that interferes with acuity OR complete internuclear ophthalmoplegia OR oscillopsia

Trigeminal Impairment:

- 0 none
- 1 signs only
- 2 mild: detectable on exam and patient aware
- 3 moderate: impaired sharp/dull in any trigeminal branch OR one episode of trigeminal neuralgia in last 24 hours
- 4 marked: loss of sharp/dull OR complete loss of sensation of one trigeminal nerve

Facial Weakness:

- 0 none
- 1 signs only
- 2 mild: detectable on exam AND patient aware
- 3 moderate: incomplete
- 4 marked: complete unilateral

Hearing Loss:

- 0 none
- 1 signs only: hears finger rub less on one or both sides but no complaint of loss
- 2 mild: grade 1 but patient aware
- 3 moderate: does not hear finger rub on one or both sides
- 4 marked: misses whispered numbers

Dysarthria:

- 0 none
- 1 signs only
- 2 mild: detectable AND patient aware
- 3 moderate: obvious AND impairs comprehension
- 4 marked: incomprehensible
- 5 mute

Dysphagia:

- 0 none
- 1 signs only
- 2 mild: difficulty with thin liquids
- 3 moderate: difficulty with liquids and solids
- 4 marked: sustained difficulty AND requires pureed diet
- 5 inability to swallow

Other Cranial Nerve Functions:

- 0 normal
- 1 signs only
- 2 mild: detectable on exam and patient aware
- 3 moderate disability
- 4 marked disability

FUNCTIONAL SYSTEM SCORE:

0	normal
1	signs only
2	moderate nystagmus and/or moderate loss EOM and/or mild other
3	severe nystagmus and/or marked loss EOM and/or moderate other
4	marked dysarthria and/or marked other
5	inability to swallow or speak

III PYRAMIDAL FUNCTIONS**General Guidance:**

- a. Weakest muscle in each group defines the score of the muscle group
- b. When possible use of functional tests (hopping on 1 foot and walking on heels/toes) is highly recommended
- c. BMRC Rating Scale for individual muscle testing:

0	no muscle contraction
1	visible contraction but no movement
2	movement only in plane of gravity
3	movement against gravity but not resistance
4	movement against resistance but not full strength
5	normal strengthA

A. UPPER EXTREMITIES:**Pronator Drift:**

0	none
1	mild
2	marked

Rapid Tapping (thumb to forefinger)

0	normal (> 16 / seconds OR too many to count)
1	mild decrease (10-15 / 5 seconds)
2	moderate decrease (5-9 / 5 seconds)
3	marked decrease (less than 5 taps in 5 seconds)

Repetitive lifting of 5-lb weight:

R L

- Deltoids
- Biceps
- Triceps
- Wrist extensors
- Wrist flexors

B. LOWER EXTREMITIES:**Rapid Tapping** (ball of foot tapping on floor with heel stationary on floor)

0	normal (> 16 / seconds OR too many to count)
1	mild decrease (10-15 / 5 seconds)
2	moderate decrease (5-9 / 5 seconds)
3	marked decrease (less than 5 taps in 5 seconds)

Lower extremity individual muscle strength:

▪ Repetitive, unilateral:	R	L
• Up on ball of foot		
• Up on heel of foot		
• Partial deep knee bends		

Leg sinking (ability to lay flat, knees fully extended and hold both legs together) :

0	none
1	mild
2	marked

Walking on heels/toes:

0	normal
1	impaired
2	not possible

Hopping on one foot:

0	11 or more times
1	6 – 10 times
2	1 – 5 times
3	not possible

Gait spasticity:

0	none
1	barely perceptible
2	minor interference with function
3	permanent shuffling; major interference with function

Overall Motor Performance:

0	normal
1	abnormal weakness compared to peers in demanding tasks but no demonstrable weakness on individual muscle testing (above)
2	decreased strength on individual muscle testing (above)

FUNCTIONAL SYSTEM SCORE:

0	normal
1	abnormal signs without disability
2	BMRC grade 4 in 1 or 2 muscle groups

- 3 grade 4 in > 2 muscle groups OR grade 3 in 1 or 2 muscle groups OR grade 2 or less in 1 muscle group
- 4 grade 2 in two limbs OR grade 0 or 1 in one limb
- 5 grade 0 or 1 in all groups both legs OR grade 2 or less in 3 limbs OR hemiplegia
- 6 tetraplegia: grade 0 or 1 in all groups of all four limbs

IV CEREBELLAR FUNCTIONS:**Head tremor:**

- 0 none
- 1 mild
- 2 moderate
- 3 severe

Truncal Ataxia:

- 0 none
- 1 signs only
- 2 mild: swaying with eyes closed
- 3 moderate: swaying with eyes open
- 4 severe: unable to sit without assistance

Limb Ataxia (tremor/dysmetria/rapid alternating movements):

- 0 none
- 1 signs only
- 2 mild: tremor or clumsy movements easily seen; minor function interference
- 3 moderate: tremor or clumsy movements interfere with all functions
- 4 severe: most functions are very difficult

Tandem Walking ("tight rope"):

- 0 normal
- 1 impaired
- 2 not possible

Gait Ataxia:

- 0 none
- 1 signs only
- 2 mild: imbalance realized by patient and/or significant other
- 3 moderate: imbalance with ordinary walking
- 4 severe: unable to walk > few steps OR requires walking aid

Romberg:

- 0 normal
- 1 mild instability with eyes closed
- 2 not stable with eyes closed
- 3 not stable with eyes open

FUNCTIONAL SYSTEM SCORE:

- 0 normal
- 1 abnormal signs without disability
- 2 mild ataxia and/or moderate Romberg and/or tandem walking not possible
- 3 moderate limb ataxia and/or moderate or severe gait/truncal ataxia
- 4 severe gait/truncal ataxia AND severe ataxia in 3 or 4 limbs
- 5 unable to perform coordinated movements due to ataxia
- X pyramidal weakness grade 3 or worse OR sensory deficits interfere with cerebellar testing

V SENSORY FUNCTIONS**Superficial sensation** (light touch and pin):

- 0 normal
- 1 signs only:
- 2 mild: slightly decreased on exam of which patient was not aware
- 3 moderate: impaired discrimination of sharp/dull
- 4 marked: unable to discriminate sharp/dull OR unable to feel light touch
- 5 complete loss of all sensation

Vibration (at most distal joint of forefinger and of great toe):

- 0 normal
- 1 mild decrease
- 2 marked decrease
- 3 complete loss of vibration

L'Hermitte's Sign: [does not contribute to Sensory FS score]

- 0 negative
- 1 positive

Paresthesias (tingling) [does not contribute to Sensory FS score]

- 0 none
- 1 present

FUNCTIONAL SYSTEM SCORE:

- 0 normal
- 1 mild vibration or light touch or pin decrease only in 1 or 2 limbs
- 2 mild decrease of light touch or pin AND?OR moderate decrease of vibration in 1 or 2 limbs OR mild decrease of vibration or pin in more than 2 limbs
- 3 moderate decrease in light touch or pin OR marked decrease vibration in 1 or 2 limbs AND/OR mild decrease in light touch or pin in more than 2 limbs
- 4 marked decrease of light touch or pin in 1 or 2 limbs
- 5 loss of all sensation in 1 or 2 limbs OR moderate decrease of light touch or pin for most of the body below the head
- 6 complete loss of sensation below head

VI BOWEL/BLADDER FUNCTIONS:**Urinary hesitancy and retention:**

- 0 none
- 1 mild: no impact on lifestyle
- 2 moderate: urinary retention; frequent urinary tract infections
- 3 severe: requires catheterization
- 4 loss of function: overflow incontinence

Urinary urgency and incontinence:

- 0 none
- 1 mild: no impact on lifestyle
- 2 moderate: incontinence once a week or less; must wear pads
- 3 severe: more frequent incontinence; must wear pads
- 4 complete loss of bladder control

Bladder catheterization:

- 0 none
- 1 intermittent self-cath
- 2 indwelling cath

Bowel Dysfunction:

- 0 none
- 1 mild: mild constipation, no incontinence, no major impact on lifestyle
- 2 moderate: must wear pads or be near lavatory; impacts lifestyle
- 3 severe: needs enema or manual disimpaction
- 4 complete loss of function

FUNCTIONAL SYSTEM SCORE:

- 0 normal
- 1 mild urinary hesitancy, urgency and/or constipation
- 2 moderate urinary hesitancy/retention and/or moderate urinary urgency/incontinence and/or moderate bowel dysfunction
- 3 frequent urinary incontinence or intermittent self-cath or needs enema/manual disimpaction
- 4 almost constant catheterization
- 5 loss of either bladder or bowel function
- 6 loss of both bladder and bowel function

VII CEREBRAL FUNCTIONS:**Depression or euphoria:**

- 0 none
- 1 present: complained of by patient or noted by significant other or investigator

Decrease in mentation:

- 0 none
- 1 signs only, not apparent to patient or significant other
- 2 mild but can handle everyday activities
- 3 moderate: abnormalities on brief MSE but fully oriented
- 4 marked: disoriented in 1 or 2 spheres; marked effect on lifestyle
- 5 confusion and complete disorientation

Fatigue:

- 0 none
- 1 mild: not interfering with daily activities
- 2 moderate: interferes with < 50% of daily activities
- 3 severe: interferes with >50% of daily activities

FUNCTIONAL SYSTEM SCORE:

- 0 normal
- 1 signs only (mild decrease in mentation or mild fatigue)
- 2 mild decrease in mentation; moderate or severe fatigue
- 3 moderate decrease in mentation
- 4 marked decrease in mentation
- 5 dementia