

NEUROLOGICAL IMPAIRMENT SECTION

OBJECTIVES FOR THE NEUROLOGICAL SYSTEM SECTION

1. Ability to determine impairment of a spinal nerve root or peripheral nerve.
2. Demonstrate correct application of Table 3 - Grading Scheme for Sensation, and Table 4 - Grading Scheme for Strength, to clinical case scenarios.
3. Locate tables for all peripheral and spinal nerves.
4. Correctly apply the sections on disturbance of language, complex integral cerebral function, emotion, consciousness, sleep and arousal disorders, and episodic neurological disorders to case scenarios.
5. Rate a patient with spinal cord dysfunction using the tables referring to station and gait, use of upper extremities, respiration, urinary bladder function, and anorectal and sexual function.
6. Identify cranial nerves that use other sections of the guide to determine impairment rating.
7. Demonstrate ability to combine appropriate values using the COMBINED VALUES CHART.

NEUROLOGICAL IMPAIRMENT

INTRODUCTION

Four rating areas are covered in this section: the brain, the spinal cord, cranial nerves, and peripheral spinal nerves. The principles for rating peripheral nerve deficits are outlined in Chapters 3 and 4. Any physician performing ratings must also have a working knowledge of those principles discussed in Chapters 1 and 2.

As with all areas of the guides, ratings are primarily based on the evaluation of activities of daily living, which include self care and personal hygiene, communication, normal living postures, ambulation, travel, non-specialized hand activities, sexual function, sleep and social and recreational activities. The physician should always consider the impact of any impairment on these activities when determining the rating.

THE BRAIN

The sections described under the brain which may be rated are: sensory and motor disturbances, language disturbances, emotional disturbances, consciousness disorders, episodic neurological disorders, and sleep and arousal disorders.

Unlike other sections, the rating in each of these areas is not combined or added. The patient receives the highest rating that has been assigned in any of the six areas.

All of the brain subsections are patterned in a similar way. The majority discuss mild disturbance of daily activities, moderate disturbance of daily activities, disturbance of daily activities which require supervision, and disturbance of daily activities which render the individual unable to care for themselves without significant supervision. This is a useful overall system to consider when performing ratings for these and other areas.

Many of the activities described in the brain section overlap with activities which could be rated in other areas, particularly those found in the mental and behavioral disorders section. It is important that a rating for a specific category or dysfunction be limited to only one section of the Guides. For example, if a neurological deficit has occurred which causes a difficulty with communication, it should be rated only in the central nervous system section, and not receive an additional rating in the psychiatric section. A psychiatric rating should be given instead of a neurological rating if there were problems which do not appear to be related to physiological brain damage, but rather to overlying psychological effects of the injury. In general, whenever possible, grading of severity in the following sections regarding the brain should be correlated with objective neuro-psychometric and speech testing instruments.

Sensory and Motor Disturbances

It is rare that a patient would receive a rating solely for a brain sensory and motor disturbance. An example of a sensory impairment which may require a rating in this area is phantom limb sensation. If a rating for a sensory disturbance is being considered, the following factors should be taken into account: 1) pain and dysesthesias, 2) disorders in the recognition of the size, shape and form of objects (astereognosis), 3) disturbance of two point and position sense, 4) paresthesias of central origin, and 5) disturbance that might be identified by more elaborate testing. If there is a disturbance of the optic nerve or vision, this should be rated under Chapter 8.

Examples of motor disorders which may receive a rating in this area would include hemiparesis, involuntary tremors, disturbances of tone and posture, bradykinesia, and cerebellar or frontal origin dysfunctions.

No chart is given for rating these disturbances. It is suggested that the physician use descriptions of similar ratings under the spinal cord, cranial nerves, peripheral nerves or other appropriate sections. These will be reviewed in the appropriate sections. Table 1, page 109, is a complete summary of all central nervous system impairment ratings systems.

Language Disturbances

The rating should be given in this area only when there is a problem with the central mechanism for language comprehension, storage and production. There are other areas for rating the ability to speak found in Chapter 9, the ear, nose, throat, and related structures impairment section. The levels for rating in this section are:

- 0-15% = minimal disturbance in comprehension and production of language symbols of daily life
- 20-45% = moderate impairment in comprehension and production of language symbols for daily living
- 50-90% = cannot comprehend language symbols, therefore has an unintelligible or inappropriate production of language for daily living
- 95% = cannot comprehend or produce language symbols sufficient for daily living.

Disturbances of Complex Integrated Cerebral Functions

The following are included under this area: memory disturbances, difficulty understanding concepts or abstracting, orientation deficits, unacceptable social behavior, and inability to initiate decisions. These are functions which are generally related to organic brain dysfunction.

- 5-15% = degree of impairment of complex integrated cerebral functions but there is ability to carry out most activities of daily living as well as before onset.
- 20-45% = degree of impairment of complex integrated cerebral functions such that daily activities need some supervision and/or direction.
- 50-90% = degree of impairment of complex integrated cerebral functions that limit daily activities to directed care under confinement at home or other domicile.
- 95% = a severe degree of impairment of complex integrated cerebral functions that the individual is unable to care for self in any situation or manner.

Emotional Disturbances

Examples of this problem include outbursts of severe rage, irritability, lack of normal emotional responses, and abnormal emotional responses. Caution must be used when rating from this section to avoid duplication with a mental disorder rating.

- 5-15% = mild to moderate emotional disturbance under unusual stress.
- 20-45% = mild to moderate emotional disturbance under ordinary stress.
- 50-90% = moderate to severe emotional disturbance under ordinary to minimal stress which requires sheltering.
- 95% = severe emotional disturbance which continually endangers self or others.

Consciousness Disturbances

This section is used to rate disturbances of consciousness that are not rated under other central nervous system sections. These include hyperactive states, stupor, etc.

- 5-35% = mild alteration in state of consciousness.
- 40-70% = moderate alteration in state of consciousness.
- 75-90% = state of stupor.
- 95% = state of coma.

Episodic Neurological Disorders

Disorders such as syncope and seizures are included in this area.

- 5-15% = disorder of slight severity which is under control such that most activities of daily living can be performed.
- 20-45% = disorder of severity sufficient to interfere moderately with activities of daily function.
- 50-90% = severe and constant disorder which limits activities to supervised, protected care or confinement.
- 95% = severe and constant disorder which totally incapacitates the individual in terms of daily living.

Sleep and Arousal Disorders

This category can conceivably overlap significantly with other diagnoses. For example, cardiovascular diagnoses such as congestive heart failure, arrhythmias and cardiac failures may cause some arousal disorders. Again, the functional impairment rated here should not overlap with functional impairment rated on the primary diagnostic section. Depression is also mentioned in this section, but usually this will be rated sufficiently under the mental and behavioral disorder section. Other disorders which reduce daytime attention and concentration should be the primary impairments rated in this section.

- 5-15% = reduced daytime alertness due to sleepiness or sleep episodes, or disturbed nocturnal sleep affecting complex integrated cerebral functions but ability remains to carry out most activities of daily living.
- 20-45% = reduced daytime alertness, requires some supervision to carry out activities of daily living.
- 50-90% = reduced daytime alertness or other sleep disturbances significantly limits activities of daily living and requires supervision by caretakers.
- 95% = severe reduction of daytime alertness such that activities of daily living are severely limited, causing the patient to be unable to care for self in any situation or manner.

SPINAL CORD

Specific sections included under the spinal cord are station and gait, use of upper extremities, respiration, urinary bladder function, anal rectal function, and sexual function. Note that sensory disturbances including pain, temperature, vibration, or positional senses, and autonomic disorders including sweating, circulation and temperature regulation, may be rated under spinal cord disorders. In this section, all of the rating areas are combined for the complete rating.

Station and Gait

- 5-20% = ability to rise to a standing position and walk, but difficulty with elevations, grades, steps and distances.
- 25-35% = ability to rise to a standing position and walk with difficulty, but limited to level surfaces and variability as to the distance the patient can walk.
- 40-60% = ability to rise to a standing position and maintain it with difficulty, but inability to walk.
- 65% = can stand only with a prosthesis or help of others.

Use of Upper Extremities

Under this section there is a separate rating for the preferred upper extremity and the non-preferred upper extremity. The physician is reminded that this "preference" may change with time and should be reevaluated as necessary. There is a separate table for rating disorders which affect both upper extremities.

	Preferred Extremity	Nonpreferred extremity	Bilateral extremity
1. use of extremity for self care, grasping and holding, but difficulty with digital dexterity	5-10%	0-5%	5-15%
2. can use the involved extremity for self care, but grasp and hold objects with difficulty and no digital dexterity	15-25%	10-15%	20-40%
3. use of involved extremity, but difficulty with self care activities	30-35%	20-25%	45-80%
4. cannot use the involved extremity for self care or cannot use upper extremities	40-60%	30-40%	85%

Respiration

- 5-20% = capable of spontaneous respiration, but difficulty in activities of daily life that require extra exertion.
- 25-50% = spontaneous respiration, but of a degree that restricts patient to sitting, standing or limited ambulation.
- 75-90% = spontaneous respiration, but of a degree that limits the patient to bed existence.
- 95% = no capacity for spontaneous respiration.

Urinary Bladder Function

This section refers only to spinal cord disorders resulting in difficulties emptying the bladder. This rating should not overlap with Chapter 11 and should be correlated with uro-dynamic testing when possible.

- 5-10% = varying degree of voluntary bladder control but is impaired by urgency.
- 15-20% = good bladder reflex activity but no voluntary control (limited capacity with intermittent emptying times).
- 25-35% = poor reflex activities (intermittent dribbling) and no voluntary control.
- 40-60% = no reflex or voluntary control of the bladder (continuous dribbling).

Anal Rectal Function

This rating should not overlap with Chapter 10, but should be correlated with functional bowel testing whenever possible.

- 0-5% = reflex regulation but only limited voluntary control
- 10-15% = reflex regulation but no voluntary control.
- 20-25% = no reflex regulation and no voluntary control.

Sexual Function

Recall that this area is to be used only for sexual difficulties caused by spinal cord injury, not problems due to other neurological or psychiatric disorders. If the patient is below the age of 40 years, the values may be increased by 50%. For example, if the patient is 25 years old and has a 10% sexual function, the rating would be increased to 15%. Conversely, if the patient is over the age of 65, the percentage impairment is decreased by 50%.

5-10% = sexual function present, but with varying degree of difficulty of erection or ejaculation in males or awareness in both sexes.

10-15% = reflex sexual function possible, but there is no awareness.

20% = no sexual function.

CRANIAL NERVES

Olfactory

A complete loss of the nerve with bilateral involvement is a 3% whole person impairment rating. If the loss is only unilateral, there is no rating.

Optic

Loss of vision in one eye is 24%. Total blindness is equal to 85%. Other partial losses should be rated according to Chapter 8.

Oculomotor IV Trochlear, and V Abducens

Permanent diplopia from a malfunction of these nerves is considered equivalent to the loss of vision of one eye, or 24% of the whole person. If the loss of function requires the patient to hold their head in an unusual position, it is suggested that ratings be combined from the impairment table on station and gait, as discussed previously in the spinal cord section, or Chapter 8, if there is a partial visual impairment.

Trigeminal

Loss of sensation on one side may be rated between 3-10% depending on dysfunction. Bilateral loss is rated between 20-35%. Tic douloureux receives a rating of 10-50% depending on the severity and frequency of attacks. A complete loss of the motor function of one side of this nerve will be rated between 2-5% impairment of the whole person. A bilateral loss of the motor function would be 30-45% of the whole person. Refer to Chapter 9 to review impairment ratings for speech and ability to swallow, which may apply to this area.

Facial

Unilateral loss of taste, which is unusual, is a 3% impairment. Unilateral paralysis is between 10-15%, and complete bilateral paralysis 30-45%. Other motor losses are established based on difficulties with speech and eating. Refer to Chapter 9.

Auditory

These ratings are described in detail in Chapter 9. Bilateral loss of hearing has a rating of 35%, and Tinnitus has a rating of 3-5%.

Glossopharyngeal, X. Vagus, XI Cranial Accessory nerves, and XII Hypoglossal.

Refer to Chapter 9 for speech ratings. The rating for diet restriction is the same in Chapter 9 and the neurological section.

PERIPHERAL SPINAL NERVES

Peripheral spinal nerves can be rated according to the three groups of fibers: sensory, motor, and autonomic. If autonomic nerve fibers affect a specific organ or body system, that Chapter should be consulted to determine the degree of impairment.

The first step in rating a nerve, nerve root, or plexus is determining its value for total motor and sensation loss. This area can be somewhat confusing as all of the nerves are not listed in the same section. Some tables are found in Chapter 4 and others in Chapter 3. The peripheral spinal nerves chart on the following page lists all available Tables.

Peripheral Spinal Nerves Chart

Nerves Rated	Table #	Page #	Type of Rating
Unilateral spinal nerves head and neck, greater occipital, lesser occipital, great auricular, spinal accessory	5	113	whole person
Unilateral spinal nerves - inguinal and perineum, iliohypogastric, ilioinguinal, pudendal, coccygeal	7	114	whole person
Thoracic nerves	6	114	whole person
Unilateral spinal nerve roots upper extremity C5 - T1	12	43	upper extremity
Unilateral Brachial Plexus upper, middle, and lower trunks	13	44	whole person and upper extremity
Named peripheral nerves upper extremity, median, radial, ulnar axillary, etc.	14	46	upper extremity and digit
Upper extremity nerve entrapment	15	46	upper extremity
Unilateral spinal nerve roots lower extremity, L-3 - S-1	49	76	lower extremity
Unilateral lumbosacral plexus	50	76	whole person
Named peripheral nerves lower extremity; femoral, gluteal, sciatic, perineal, tibial, etc.	51	77	lower extremity

All nerves must be graded according to sensation loss and motor loss. In the neurological section, Chapter 4, Table 3, page 112 is used to grade sensation loss and Table 4, page 113, is for grading motor loss. When the nerve being rated is in Chapter 3, the upper and lower extremity and spine impairment chapter, use the Chapter 3 tables. In Chapter 3 the sensation grading system is found on page 42, Table 10 and the motor grading system is on Table 11, page 42. The grading tables differ slightly between the two chapters. All four grading tables include a summary of how to grade peripheral nerves at the bottom of the table.

The sensation loss is determined using verifiable sensation deficits, the presence of pain and the effect on activity performance. The ranges for sensation loss from Table 10, Chapter 3:

- 0% = no loss of sensation or spontaneous abnormal sensation
- 1-25% = decreased sensation with or without pain which is forgotten during activity
- 26-60% = decreased sensation with or without pain which interferes with activity
- 61-80% = decreased sensation with or without pain which may prevent activities (minor causalgia)
- 81-95% = decreased sensation with severe pain which may cause outcries as well as prevent activity (major causalgia)
- 96-100% = decreased sensation with pain, which may prevent all activity.

Once the sensation loss is determined from the grading deficit, it must be multiplied by the total loss of sensation rating for the specific nerve involved. This number will be found on one of the tables listed on the Peripheral Spinal Nerves Chart on the previous page.

Graded Sensation % X Total Sensation Loss for the specific nerve = Sensation Impairment Rating % for the nerve in the specific case

Motor strength, as determined by gross resistance testing of the affected nerve, is graded in Chapter 3 using Table 11, page 42, and the following categories:

- 0% = complete range of motion against gravity and full resistance.
- 1-25% = complete range of motion against gravity and some resistance, or reduced fine movements in motor control.
- 26-50% = complete range of motion against gravity and only without resistance.

51-75% = complete range of motion with gravity eliminated.

76-99% = slight contractibility, but no joint motion.

100% = no contractibility.

The percentage grade of the motor deficit is multiplied by the maximum loss of strength due to the nerve identified in order to determine the motor loss.

Graded Motor % X Total Motor Loss for the specific nerve = Motor Impairment Rating % for the nerve in the specific case

The sensation and motor nerve deficits are combined in order to arrive at the total deficit for that nerve or extremity. Review the examples found on page 77 which calculate the neurological losses for a specific patient.

Case Example:

A fifty seven year old legal secretary spends a minimum of 4 hours a day typing and develops carpal tunnel syndrome. Her EMG demonstrated median nerve changes and conservative measures did not improve her condition. After a carpal tunnel release the patient improved but continued to have a motor deficit of median nerve functions which allowed complete range of motion against some resistance and resulted in a reduction in fine movements. She also experienced decreased sensation in the entire median nerve distribution below mid-forearm with pain which prevented her from typing more than 15 minutes per hour. To determine her impairment rating Table 14, page 46, is consulted to determine the maximum % loss for the median nerve below the mid forearm. Maximum sensation loss is 40%. Using Table 10, page 42, this patient has a grade 4 sensation loss. Thus for a highly motivated and consistent patient, 80% may be multiplied by 40% for a 32% upper extremity impairment due to loss of sensation. Any number in the grade 4 range may be used, 61-80%. A lower rating may be appropriate depending on the patient's difficulty with activities of daily living. Using Table 11, page 42, this patient has a grade 2 motor loss (1%-25%). Thus 25% (or a percentage chosen within the Grade 2 range) may be multiplied by the maximum permissible loss of 35% for a 9% upper extremity motor loss. These values are combined using the Combined Values Chart, page 254, for 38% total upper extremity impairment. [In this case any range of motion deficits that may occur are secondary to a nerve deficit and thus not used in the rating.] The upper extremity rating may be converted to a whole person rating using Table 3, page 16. The whole person rating equals 23%. Ratings should be expressed both as extremity and whole person correlates.

Table 14, page 46 will result in an objective and supportable report on impairment due to peripheral nerve entrapment. Ratings using Table 15, page 46 are not recommended because the AMA Guides do not provide any definitions for mild, moderate and severe.

Range of motion deficits cannot be combined with motor deficits of the nerve if the range of motion deficits are secondary to motor nerve damage. (See page 41) In other words, if the patient has suffered a brachial plexus injury and has significant range of motion deficits of the wrist and elbow due to lack of motor function, these range of motion deficits should not be applied to the impairment rating. The motor deficit that you calculate for the involved nerves will take into account the range of motion deficit. Range of motion deficits are used for impairments which are not secondary to neurological dysfunction.

REFLEX SYMPATHETIC DYSTROPHY (CHRONIC REGIONAL PAIN SYNDROME) AND RELATED ISSUES

According to the Third revised edition of the AMA Guides, autonomic function may be rated by rating peripheral nerves, spinal nerve roots, spinal plexus or spinal cord functions (Chapter 4, Table 1). The task force on reflex sympathetic dystrophy advocated use of the spinal cord impairment tables for upper extremity or station and gait. If the injury has mainly caused sensation and motor deficits, it may be appropriate to use the sensation and motor percentage ratings for the appropriate peripheral nerves. Remember that range of motion deficits should not be calculated unless they were due to a cause other than a neurological injury such as reflex sympathetic dystrophy, since the rating for range of motion and deficits would be included in the sensation and motor deficits calculated.

In most cases, a rating for the autonomic dysfunction alone, i.e. temperature changes or vascular changes, will not be necessary as the effects on daily living can be sufficiently rated under the sensation grade for the nerve. However, if there is consistent vascularity change which has affected the tissue, or caused a significant change in the patient's daily function, this impairment should be combined with the neurological deficit. Use Table 16, page 47 which refers to impairment of the upper extremity due to peripheral vascular disease. Table 52, page 79, rates peripheral vascular disease in the lower extremity.

Related articles of interest:

Amadio, Peter C. et al, Reflex Sympathetic Dystrophy Syndrome: Consensus Report of an Ad Hoc Committee of the American Association for Hand Surgery and the definition of reflex sympathetic dystrophy syndrome; Plastic and Reconstruction Surgery 87:2, February, 1991, pages 371 -375.

Schwartzman, Robert J. and McLellan, Tony L.; Reflex Sympathetic Dystrophy: A Review; Archives of Neurology, Volume 44, May 1977, pages 555 - 561.

HELPFUL HINTS FOR GRADING NEUROLOGICAL DEFICITS

Report nerve findings on required report forms

- Upper extremity nerves – Upper Extremity Report Section III, Figure 1, Part 2 (page 13)
- Lower extremity nerves – Lower extremity report sheet in curriculum
- Spinal nerve root impairments – Spine impairment summary report sheet (Figure 84, p. 85)

Reference figures and tables for peripheral nerves and nervous system functions: *(These may be useful in localizing the level of nervous system pathology prior to the determination of impairment using the impairment tables.)*

- *Cutaneous sensory dermatomes of upper extremity and related peripheral nerves and roots – Figure 45, p. 39*
- *Origins and functions (motor and sensory) of the peripheral nerves of the upper extremity emanating from the brachial plexus (cervical 5 to 8 and Thoracic) – Table 9, p. 40*
- *Brachial plexus anatomic diagram – Figure 46, p. 44*
- *Motor innervation of the upper extremity – Figure 47, p. 45*
- *Sensory nerves of the lower extremity and their roots of origin – Figure 77, p. 73*
- *Origins and functions (motor and sensory) of the peripheral nerves to the lower extremity – Table 48, p. 74*
- *Lumbosacral plexus anatomic diagram – Figure 78, p. 75*
- *Motor innervation of the lower extremity – Figure 79, p. 75*

First step required to grade peripheral nerves

Locate maximum impairment loss for the nerve affected using the appropriate table identified on the attached chart. ***(Note whether the impairment is provided as an extremity impairment or whole person impairment.)***

Peripheral Spinal Nerves Chart (Chart in Level II curriculum – Neurological Section, p. 47)

Nerves Rated	Table #	Page #	Type of Rating
Unilateral spinal nerves head and neck, greater occipital, lesser occipital, great auricular, spinal accessory	5	113	whole person
Unilateral spinal nerves - inguinal and perineum, iliohypogastric, ilioinguinal, pudendal, coccygeal	7	114	whole person

Nerves Rated	Table #	Page #	Type of Rating
Thoracic nerves	6	114	whole person
Unilateral spinal nerve roots upper extremity C5 - T1	12	43	upper extremity
Unilateral Brachial Plexus upper, middle, and lower trunks	13	44	whole person and upper extremity
Named peripheral nerves upper extremity, median, radial, ulnar axillary, etc.	14	46	upper extremity and digit
Upper extremity nerve entrapment	15	46	upper extremity
Unilateral spinal nerve roots lower extremity, L-3 - S-1	49	76	lower extremity
Unilateral lumbosacral plexus	50	76	whole person
Named peripheral nerves lower extremity; femoral, gluteal, sciatic, perineal, tibial, etc.	51	77	lower extremity

Second step for grading peripheral nerve impairment –

Record maximum sensory and motor values for the affected nerve from the above tables.

Third step for grading peripheral nerve impairment –

Grade the sensory and motor loss for each nerve using the grading table from the same chapter as the maximum value for the nerve.

- Grading table for sensory and motor impairment for Chapter 3 (upper and lower extremity)
 - ✓ Sensory – Table 10, p. 42
 - ✓ Motor – Table 11, p. 42
- Grading table for sensory and motor impairment for Chapter 4 (nervous system)
 - ✓ Sensory – Table 3, p. 112
 - ✓ Motor – Table 4, p. 113
- To grade sensory deficit use physical exam findings and expected functional deficits
- To grade motor deficit use confrontational strength testing – 5/5 scale

Fourth step for grading peripheral nerve impairment –

Multiply sensory deficit % from above tables by maximum sensory nerve loss %- Multiply motor deficit% from above tables by maximum motor nerve loss %

Fifth Step for grading peripheral nerve impairment -

Combine sensory and motor values

OTHER IMPAIRMENT RATINGS

- Digital nerves are rated using a different system
 - ❖ Determine the length of the finger affected
 - Thumb and little finger – Figure 7, p. 19
 - Other digits – Figure 17, p. 25
 - ❖ Determine if digital nerve is partially affected (2-pt 7-15mm) or totally impaired (2-pt > 15mm)
 - Thumb and little finger rate using Table 4, p. 20 hand rating
 - Other digits – Table 8, p. 25
 - ❖ When the rating for each digit is completed convert to
 - Table 1, p. 15 digit to hand
 - Add all digits ratings in hand impairment rating %
 - When hand rating is completed, convert to upper extremity
 - Table 2, p 16 for hand to upper extremity
 - Table 3, p. 16 for upper extremity to % whole person impairment)
- Upper extremity entrapment peripheral neuropathy – Table 15, p. 46 (Note: “upper extremity” units)
 - ❖ The Division of Workers’ Compensation recommends that this table NOT be used since the categories of impairment (mild, moderate and severe) are not defined, and Table 14 is more specific.
- CRPS
 - ❖ Table 1, p. 109, Chapter 4 (the Division preferred method for rating CRPS)
 - ❖ Upper extremity and lower extremity vascular tables, p. 47 & 79 may be used to rate impairment due to severe swelling associated with chronic regional pain syndrome if functional deficit is not covered by Table 1 rating
 - ❖ In some cases of CRPS II use of the peripheral nerve table may be acceptable

- Grip strength impairment – pp. 52-54, very rarely appropriate – should never be used with a neurologic injury since neurologic injuries must be rated according to muscle strength testing as previously described.
 - ❖ % strength index = [Normal mean strength (use measured non-injured side or Tables 20-22, p. 53) – abnormal mean strength] ÷ normal mean strength (See p. 54)
 - ❖ Find % strength index impairment table – Table 23, p. 54 (Note: “upper extremity” units)
 - ❖ Note: The grip strength method may be used only when the peripheral nerve table is not directly applicable, i.e., crush injury resulting in fractures and ROM alone does not account for the functional deficit.

- Spinal cord impairment (Note: “whole person” units)
 - ❖ Use Table 1, p. 109, left side “A” Spinal Cord and/or Brain”
 Note: multiple categories can be combined from this column

- Brain impairment (Note: “whole person” units)
 - ❖ Brain categorical impairments are not combined. Instead the largest numerical value of all categories rated is used to reflect total impairment due to brain pathology (see p. 104). Usually this refers to the categories on the right side “B.Brain” of Table 1, but would also include any categories of brain impairment from the left side “A”.

- Cranial nerves – Table 2, p. 111 (Note: “whole person” units)
 - ❖ Note: Do not “double rate” by using both the cranial nerve impairment rating and the applicable end organ rating from its chapter in the Guides (i.e. vision, hearing, dysequilibrium).
 - ❖ Generally corresponding end organ impairment will be rated using the appropriate chapter in the Guides rather than the cranial nerve impairment.