INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY (ISNCSCI)

ASIA American Spinal Injury Association — ISCOS International Spinal Cord Society

Patient Name _____ Date/Time of Exam _____

Examiner Name _____ Signature _____

RIGHT

MOTOR KEY MUSCLES		SENSORY KEY SENSORY POINTS Light Touch (LTR)	Pin Prick (PPR)
	C2		
	C3		
	C4		
Elbow flexors	C5		
Wrist extensors	C6		
Elbow extensors	C7		
Finger flexors	C8		
Finger abductors (little finger)	T1		
	T2		
	T3		
	T4		
	T5		
	T6		
	T7		
	T8		
	T9		
	T10		
	T11		
	T12		
	L1		
Hip flexors	L2		
Knee extensors	L3		
Ankle dorsiflexors	L4		
Long toe extensors	L5		
Ankle plantar flexors	S1		
	S2		
	S3		
	S4-5		
		(50)	(56) (56)

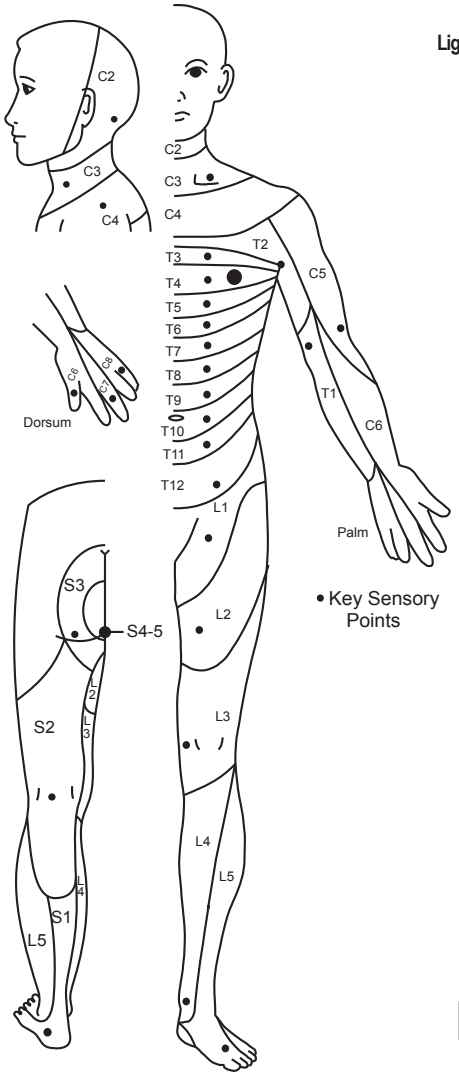
UER (Upper Extremity Right)

LER (Lower Extremity Right)

Comments *(Non-key Muscle? Reason for NT? Pain? Non-SCI condition?):*

(VAC) Voluntary Anal Contraction (Yes/No) ☐

RIGHT TOTALS **(MAXIMUM)** ☐ (50) ☐ (56) ☐ (56)



LEFT

SENSORY KEY SENSORY POINTS Light Touch (LTL)	Pin Prick (PPL)	MOTOR KEY MUSCLES	
		C2	
		C3	
		C4	
		C5	*Elbow flexors*
		C6	*Wrist extensors*
		C7	*Elbow extensors*
		C8	*Finger flexors*
		T1	*Finger abductors (little finger)*
		T2	
		T3	
		T4	
		T5	
		T6	
		T7	
		T8	
		T9	
		T10	
		T11	
		T12	
		L1	
		L2	*Hip flexors*
		L3	*Knee extensors*
		L4	*Ankle dorsiflexors*
		L5	*Long toe extensors*
		S1	*Ankle plantar flexors*
		S2	
		S3	
		S4-5	
(56)	(56)	(50)	

UEL (Upper Extremity Left)

LEL (Lower Extremity Left)

MOTOR (SCORING ON REVERSE SIDE)

0 = Total paralysis
1 = Palpable or visible contraction
2 = Active movement, gravity eliminated
3 = Active movement, against gravity
4 = Active movement, against some resistance
5 = Active movement, against full resistance
NT = Not testable
0, 1*, 2*, 3*, 4*, NT* = Non-SCI condition present*

SENSORY (SCORING ON REVERSE SIDE)

0 = Absent — *NT = Not testable*
1 = Altered — *0*, 1*, NT* = Non-SCI condition present*
2 = Normal

(DAP) Deep Anal Pressure (Yes/No) ☐

LEFT TOTALS **(MAXIMUM)**

MOTOR SUBSCORES

UER ☐ **+UEL** ☐ = ***UEMS TOTAL*** ☐ *MAX (25) (25) (50)*

LER ☐ **+ LEL** ☐ = ***LEMS TOTAL*** ☐ *MAX (25) (25) (50)*

SENSORY SUBSCORES

LTR ☐ **+ LTL** ☐ = ***LT TOTAL*** ☐ *MAX (56) (56) (112)*

PPR ☐ **+ PPL** ☐ = ***PP TOTAL*** ☐ *MAX (56) (56) (112)*

NEUROLOGICAL LEVELS
Steps 1- 6 for classification as on reverse

	R	L
1. SENSORY	☐	☐
2. MOTOR	☐	☐

3. NEUROLOGICAL LEVEL OF INJURY (NLI) ☐

4. COMPLETE OR INCOMPLETE? ☐
Incomplete = Any sensory or motor function in S4-5

5. ASIA IMPAIRMENT SCALE (AIS) ☐

(In injuries with absent motor OR sensory function in S4-5 only)

6. ZONE OF PARTIAL PRESERVATION
Most caudal levels with any innervation

	R	L
SENSORY	☐	☐
MOTOR	☐	☐

REV 04/19

Muscle Function Grading

0 = Total paralysis

1 = Palpable or visible contraction

2 = Active movement, full range of motion (ROM) with gravity eliminated

3 = Active movement, full ROM against gravity

4 = Active movement, full ROM against gravity and moderate resistance in a muscle specific position

5 = (Normal) active movement, full ROM against gravity and full resistance in a functional muscle position expected from an otherwise unimpaired person

NT = Not testable (i.e. due to immobilization, severe pain such that the patient cannot be graded, amputation of limb, or contracture of > 50% of the normal ROM)

0*, 1*, 2*, 3*, 4*, NT* = Non-SCI condition present [a]

Sensory Grading

0 = Absent **1** = Altered, either decreased/impaired sensation or hypersensitivity

2 = Normal **NT** = Not testable

0*, 1*, NT* = Non-SCI condition present [a]

[a] Note: Abnormal motor and sensory scores should be tagged with a '*' to indicate an impairment due to a non-SCI condition. The non-SCI condition should be explained in the comments box together with information about how the score is rated for classification purposes (at least normal / not normal for classification).

When to Test Non-Key Muscles:

In a patient with an apparent AIS B classification, non-key muscle functions more than 3 levels below the motor level on each side should be tested to most accurately classify the injury (differentiate between AIS B and C).

Movement	Root level
Shoulder: Flexion, extension, adbuction, adduction, internal and external rotation **Elbow:** Supination	**C5**
Elbow: Pronation **Wrist:** Flexion	**C6**
Finger: Flexion at proximal joint, extension **Thumb:** Flexion, extension and abduction in plane of thumb	**C7**
Finger: Flexion at MCP joint **Thumb:** Opposition, adduction and abduction perpendicular to palm	**C8**
Finger: Abduction of the index finger	**T1**
Hip: Adduction	**L2**
Hip: External rotation	**L3**
Hip: Extension, abduction, internal rotation **Knee:** Flexion **Ankle:** Inversion and eversion **Toe:** MP and IP extension	**L4**
Hallux and Toe: DIP and PIP flexion and abduction	**L5**
Hallux: Adduction	**S1**

ASIA Impairment Scale (AIS)

A = Complete. No sensory or motor function is preserved in the sacral segments S4-5.

B = Sensory Incomplete. Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-5 (light touch or pin prick at S4-5 or deep anal pressure) AND no motor function is preserved more than three levels below the motor level on either side of the body.

C = Motor Incomplete. Motor function is preserved at the most caudal sacral segments for voluntary anal contraction (VAC) OR the patient meets the criteria for sensory incomplete status (sensory function preserved at the most caudal sacral segments S4-5 by LT, PP or DAP), and has some sparing of motor function more than three levels below the ipsilateral motor level on either side of the body. (This includes key or non-key muscle functions to determine motor incomplete status.) For AIS C – less than half of key muscle functions below the single NLI have a muscle grade ≥ 3.

D = Motor Incomplete. Motor incomplete status as defined above, with at least half (half or more) of key muscle functions below the single NLI having a muscle grade ≥ 3.

E = Normal. If sensation and motor function as tested with the ISNCSCI are graded as normal in all segments, and the patient had prior deficits, then the AIS grade is E. Someone without an initial SCI does not receive an AIS grade.

Using ND: To document the sensory, motor and NLI levels, the ASIA Impairment Scale grade, and/or the zone of partial preservation (ZPP) when they are unable to be determined based on the examination results.

ASIA
AMERICAN SPINAL INJURY ASSOCIATION

INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY

ISCOS
INTERNATIONAL SPINAL CORD SOCIETY

Steps in Classification

The following order is recommended for determining the classification of individuals with SCI.

1. Determine sensory levels for right and left sides.
The sensory level is the most caudal, intact dermatome for both pin prick and light touch sensation.

2. Determine motor levels for right and left sides.
Defined by the lowest key muscle function that has a grade of at least 3 (on supine testing), providing the key muscle functions represented by segments above that level are judged to be intact (graded as a 5).
Note: in regions where there is no myotome to test, the motor level is presumed to be the same as the sensory level, if testable motor function above that level is also normal.

3. Determine the neurological level of injury (NLI).
This refers to the most caudal segment of the cord with intact sensation and antigravity (3 or more) muscle function strength, provided that there is normal (intact) sensory and motor function rostrally respectively.
The NLI is the most cephalad of the sensory and motor levels determined in steps 1 and 2.

4. Determine whether the injury is Complete or Incomplete.
(i.e. absence or presence of sacral sparing)
*If voluntary anal contraction = **No** AND all S4-5 sensory scores = **0***
*AND deep anal pressure = **No**, then injury is **Complete.***
*Otherwise, injury is **Incomplete**.*

5. Determine ASIA Impairment Scale (AIS) Grade.
Is injury Complete? If YES, AIS=A

NO ↓

Is injury Motor Complete? If YES, AIS=B

NO ↓ (No=voluntary anal contraction OR motor function more than three levels below the motor level on a given side, if the patient has sensory incomplete classification)

Are at least half (half or more) of the key muscles below the neurological level of injury graded 3 or better?

NO ↓ **AIS=C**

YES ↓ **AIS=D**

If sensation and motor function is normal in all segments, AIS=E
Note: AIS E is used in follow-up testing when an individual with a documented SCI has recovered normal function. If at initial testing no deficits are found, the individual is neurologically intact and the ASIA Impairment Scale does not apply.

6. Determine the zone of partial preservation (ZPP).
The ZPP is used only in injuries with absent motor (no VAC) OR sensory function (no DAP, no LT and no PP sensation) in the lowest sacral segments S4-5, and refers to those dermatomes and myotomes caudal to the sensory and motor levels that remain partially innervated. With sacral sparing of sensory function, the sensory ZPP is not applicable and therefore "NA" is recorded in the block of the worksheet. Accordingly, if VAC is present, the motor ZPP is not applicable and is noted as "NA".

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Motor Upper Limb Total - Right	Motor Upper Limb Total - Left	Motor Upper Limb Total - Right + Left	Motor Lower Limb Total - Right	Motor Lower Limb Total - Left	Motor Lower Limb Total - Right + Left	Sensory Light Touch Total - Right	Sensory Light Touch Total - Left	Sensory Light Touch Total - Right + Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	Numeric (0-25)	Numeric (0-25)	Numeric (0-50)	Numeric (0-25)	Numeric (0-25)	Numeric (0-50)	Numeric (0-56)	Numeric (0-56)	Numeric (0 to 112)
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	MTRULR	MTRULL	MTRULT	MTRLLR	MTRLLL	MTRLLT	SENSLTR	SENSLTL	SENSLTT
Comments/ Suggested Revisions					Should be derived from raw data in extended data set	Should be derived from raw data in extended data set	Should be derived from right and left subtotals	Should be derived from raw data in extended data set	Should be derived from raw data in extended data set	Should be derived from right and left subtotals	Should be derived from raw data in extended data set	Should be derived from raw data in extended data set	Should be derived from right and left subtotals

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick Total - Right	Sensory Pin Prick Total - Left	Sensory Pin Prick Total - Right + Left	Voluntary anal contraction?	Any anal sensation?	Sensory Neurological Level - Right	Sensory Neurological Level - Left	Motor Neurological Level - Right	Motor Neurological Level - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	Numeric (0-56)	Numeric (0-56)	Numeric (0 to 112)	Yes No	Yes No	C01-C08 Cervical (C1 - C8) T01-T12 Thoracic (T1 - T12) L01-L05 Lumbar (L1 - L5) S01-S05 Sacral (S1 - S5) X00 Normal X99 Unknown or Not Done		C01-C08 Cervical (C1 - C8) T01-T12 Thoracic (T1 - T12) L01-L05 Lumbar (L1 - L5) S01-S05 Sacral (S1 - S5) X00 Normal X99 Unknown or Not Done	
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	SENSPPR	SENSPPL	SENSPPT	ANALCONT	ANALSENS	SENSLVLR	SENSLVLL	MTRLVLR	MTRLVLL
Comments/ Suggested Revisions					Should be derived from raw data in extended data set	Should be derived from raw data in extended data set	Should be derived from right and left subtotals						

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Complete or Incomplete?	ASIA Impairment Scale	Sensory Zone of Partial Preservation - Right	Sensory Zone of Partial Preservation - Left	Motor Zone of Partial Preservation - Right	Motor Zone of Partial Preservation - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	Complete Incomplete	A Complete Injury. B Incomplete. C Incomplete. D Incomplete. E Normal. U Unknown or not applicable.	C01-C08 Cervical (C1 - C8) T01-T12 Thoracic (T1 - T12) L01-L05 Lumbar (L1 - L5) S01-S05 Sacral (S1 - S5) X00 Normal X99 Unknown or Not Done		C01-C08 Cervical (C1 - C8) T01-T12 Thoracic (T1 - T12) L01-L05 Lumbar (L1 - L5) S01-S05 Sacral (S1 - S5) X00 Normal X99 Unknown or Not Done	
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	COMPLETE	AIS	SENSZPPR	SENSZPPL	MTRZPPR	MTRZPPL
Comments/ Suggested Revisions						A. Complete: No sensory or motor function is preserved in the sacral segments S4-S5. B. Incomplete: Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5, AND no motor function is preserved more than three levels below the motor level on either side of the body. C. Incomplete: Motor function is preserved below the neurological level, and more than half of key muscles below the neurological level have a muscle grade less than 3. D. Incomplete: Motor function is preserved below the neurological level, and at least half of key muscles below the neurological level have a muscle grade of 3 or more. E. Normal: Motor and sensory function are normal.				

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Motor Elbow flexors - Right	Motor Elbow flexors - Left	Motor Wrist extensors - Right	Motor Wrist extensors - Left	Motor Elbow extensors - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C5MTRR	C5MTRL	C6MTRR	C6MTRL	C7MTRR
Comments/ Suggested Revisions									

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Motor Elbow extensors - Left	Motor Finger flexors - Right (distal phalanx of middle finger)	Motor Finger flexors - Left (distal phalanx of middle finger)	Motor Finger abductors - Right (little finger)	Motor Finger abductors - Left (little finger)
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C7MTRL	C8MTRR	C8MTRL	T1MTRR	T1MTRL
Comments/ Suggested Revisions									

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Motor Hip flexors - Right	Motor Hip flexors - Left	Motor Knee extensors - Right	Motor Knee extensors - Left	Motor Ankle dorsiflexors - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	L2MTRR	L2MTRL	L3MTRR	L3MTRL	L4MTRR
Comments/ Suggested Revisions									

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Motor Ankle dorsiflexors - Left	Motor Long toe extensors - Right	Motor Long toe extensors - Left	Motor Ankle plantar flexors - Right	Motor Ankle plantar flexors - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present	0 = total paralysis 1 = palpable or visible contraction 2 = active movement, full range of motion, gravity eliminated 3 = active movement, full range of motion, against gravity 4 = active movement, full range of motion, against gravity and provides some resistance 5 = active movement, full range of motion, against gravity and provides normal resistance 5* = muscle able to exert, in examiner's judgement, sufficient resistance to be considered normal if identifiable inhibiting factors were not present
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	L4MTRL	L5MTRR	L5MTRL	S1MTRR	S1MTRL
Comments/ Suggested Revisions									

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch C2 - Right	Sensory Light Touch C2 - Left	Sensory Pin Prick C2 - Right	Sensory Pin Prick C2 - Left	Sensory Light Touch C3 - Right	Sensory Light Touch C3 - Left	Sensory Pin Prick C3 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C2SLTR	C2SLTL	C2SPPR	C2SPPL	C3SLTR	C3SLTL	C3SPPR
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick C3 - Left	Sensory Light Touch C4 - Right	Sensory Light Touch C4 - Left	Sensory Pin Prick C4 - Right	Sensory Pin Prick C4 - Left	Sensory Light Touch C5 - Right	Sensory Light Touch C5 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C3SPPL	C4SLTR	C4SLTL	C4SPPR	C4SPPL	C5SLTR	C5SLTL
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick C5 - Right	Sensory Pin Prick C5 - Left	Sensory Light Touch C6 - Right	Sensory Light Touch C6 - Left	Sensory Pin Prick C6 - Right	Sensory Pin Prick C6 - Left	Sensory Light Touch C7 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C5SPPR	C5SPPL	C6SLTR	C6SLTL	C6SPPR	C6SPPL	C7SLTR
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch C7 - Left	Sensory Pin Prick C7 - Right	Sensory Pin Prick C7 - Left	Sensory Light Touch C8 - Right	Sensory Light Touch C8 - Left	Sensory Pin Prick C8 - Right	Sensory Pin Prick C8 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	C7SLTL	C7SPPR	C7SPPL	C8SLTR	C8SLTL	C8SPPR	C8SPPL
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch T1 - Right	Sensory Light Touch T1 - Left	Sensory Pin Prick T1 - Right	Sensory Pin Prick T1 - Left	Sensory Light Touch T2 - Right	Sensory Light Touch T2 - Left	Sensory Pin Prick T2 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T1SLTR	T1SLTL	T1SPPR	T1SPPL	T2SLTR	T2SLTL	T2SPPR
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick T2 - Left	Sensory Light Touch T3 - Right	Sensory Light Touch T3 - Left	Sensory Pin Prick T3 - Right	Sensory Pin Prick T3 - Left	Sensory Light Touch T4 - Right	Sensory Light Touch T4 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T2SPPL	T3SLTR	T3SLTL	T3SPPR	T3SPPL	T4SLTR	T4SLTL
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick T4 - Right	Sensory Pin Prick T4 - Left	Sensory Light Touch T5 - Right	Sensory Light Touch T5 - Left	Sensory Pin Prick T5 - Right	Sensory Pin Prick T5 - Left	Sensory Light Touch T6 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T4SPPR	T4SPPL	T5SLTR	T5SLTL	T5SPPR	T5SPPL	T6SLTR
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch T6 - Left	Sensory Pin Prick T6 - Right	Sensory Pin Prick T6 - Left	Sensory Light Touch T7 - Right	Sensory Light Touch T7 - Left	Sensory Pin Prick T7 - Right	Sensory Pin Prick T7 - Left	Sensory Light Touch T8 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T6SLTL	T6SPPR	T6SPPL	T7SLTR	T7SLTL	T7SPPR	T7SPPL	T8SLTR
Comments/ Suggested Revisions												

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch T8 - Left	Sensory Pin Prick T8 - Right	Sensory Pin Prick T8 - Left	Sensory Light Touch T9 - Right	Sensory Light Touch T9 - Left	Sensory Pin Prick T9 - Right	Sensory Pin Prick T9 - Left	Sensory Light Touch T10 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T8SLTL	T8SPPR	T8SPPL	T9SLTR	T9SLTL	T9SPPR	T9SPPL	T10SLTR
Comments/ Suggested Revisions												

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch T10 - Left	Sensory Pin Prick T10 - Right	Sensory Pin Prick T10 - Left	Sensory Light Touch T11 - Right	Sensory Light Touch T11 - Left	Sensory Pin Prick T11 - Right	Sensory Pin Prick T11 - Left	Sensory Light Touch T12 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T10SLTL	T10SPPR	T10SPPL	T11SLTR	T11SLTL	T11SPPR	T11SPPL	T12SLTR
Comments/ Suggested Revisions												

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch T12 - Left	Sensory Pin Prick T12 - Right	Sensory Pin Prick T12 - Left	Sensory Light Touch L1 - Right	Sensory Light Touch L1 - Left	Sensory Pin Prick L1 - Right	Sensory Pin Prick L1 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	T12SLTL	T12SPPR	T12SPPL	L1SLTR	L1SLTL	L1SPPR	L1SPPL
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch L2 - Right	Sensory Light Touch L2 - Left	Sensory Pin Prick L2 - Right	Sensory Pin Prick L2 - Left	Sensory Light Touch L3 - Right	Sensory Light Touch L3 - Left	Sensory Pin Prick L3 - Right	Sensory Pin Prick L3 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	L2SLTR	L2SLTL	L2SPPR	L2SPPL	L3SLTR	L3SLTL	L3SPPR	L3SPPL
Comments/ Suggested Revisions												

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Light Touch L4 - Right	Sensory Light Touch L4 - Left	Sensory Pin Prick L4 - Right	Sensory Pin Prick L4 - Left	Sensory Light Touch L5 - Right	Sensory Light Touch L5 - Left	Sensory Pin Prick L5 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	L4SLTR	L4SLTL	L4SPPR	L4SPPL	L5SLTR	L5SLTL	L5SPPR
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick L5 - Left	Sensory Light Touch S1 - Right	Sensory Light Touch S1 - Left	Sensory Pin Prick S1 - Right	Sensory Pin Prick S1 - Left	Sensory Light Touch S2 - Right	Sensory Light Touch S2- Left	Sensory Pin Prick S2 - Right
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	L5SPPL	S1SLTR	S1SLTL	S1SPPR	S1SPPL	S2SLTR	S2SLTL	S2SPPR
Comments/ Suggested Revisions												

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick S2 - Left	Sensory Light Touch S3 - Right	Sensory Light Touch S3- Left	Sensory Pin Prick S3 - Right	Sensory Pin Prick S3 - Left	Sensory Light Touch S4-5 - Right	Sensory Light Touch S4-5- Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	S2SPPL	S3SLTR	S3SLTL	S3SPPR	S3SPPL	S45SLTR	S45SLTL
Comments/ Suggested Revisions											

Proposed 8 Character Variables:

Data Element	Site	Subject	Date of Exam	Time of Exam	Sensory Pin Prick S4-5 - Right	Sensory Pin Prick S4-5 - Left
Format/ Codes			Numeric (yyyymmdd) 8888-88-88 Not Done 9999-99-99 Unknown	Numeric (hh:mm) with 24 hour clock 88:88 Not Done 99:99 Unknown	0 = absent 1 = impaired 2 = normal NT = not testable	0 = absent 1 = impaired 2 = normal NT = not testable
8 Character Variable	SITE	SUBJECT	NEUEXMDT	NEUEXTM	S45SPPR	S45SPPL
Comments/ Suggested Revisions						

Pediatric ISNCSCI Recommendations:

Recommended as Core for youth 6 years of age and older

Further research needed to develop objective methods to evaluate neurological consequence of SCI in youth <6 years old.

Evaluators should review the InSTEP and WeeSTEP e-learning modules from the American Spinal Injury Association (ASIA) prior to performing the ISNCSCI on youth, especially in presence of neuromuscular scoliosis and hip subluxation and dislocation.

Pediatric-Specific References:

Mulcahey MJ, Vogel L, Betz R, Samdani A, Chafetz R, Gaughan J. The international standards for neurological classification of spinal cord injury: psychometric evaluation and guidelines for use with children and youth. Phys Med Rehabil, 2011; 92:1264–1269.

Vogel L, Samdani A, Chafetz R, Gaughan J, Betz RR, Mulcahey MJ. Intra-rater reliability of the anorectal examination and classification of injury severity in children with spinal cord injury. Spinal Cord 2009; 47(9):687–691.

Chafetz R, Gaughan J, Mulcahey MJ. The international standards for neurological classification of spinal cord injury: Intra-rater reliability of ISCSCI motor and sensory scores in the pediatric population. J Spinal Cord Med 2009; 32(2):157–161.

Mulcahey MJ, Gaughan J, Betz RR, Vogel L. Rater reliability of the International Classification of Spinal Cord Injury before and after formal training. J Spinal Cord Medicine 2007;30(1):S146–S150.

Mulcahey, MJ, Gaughan J, Betz RR, Johanson K. The international standards for neurological classification of SCI: reliability of data when applied to children and youth. Spinal Cord 2007;45:452–459.