

AMERICA SPINAL CORD INJURY (ASIA) SCALE

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

Patient Name _____

Date/Time of Exam _____

Examiner Name _____

Signature _____

RIGHT

KEY MUSCLES

UER
(Upper Extremity Right)

Elbow flexors C5

Wrist extensors C6

Elbow extensors C7

Finger flexors C8

Finger abductors (little finger) T1

LER
(Lower Extremity Right)

Hip flexors L2

Knee extensors L3

Ankle dorsiflexors L4

Long toe extensors L5

Ankle plantar flexors S1

(VAC) Voluntary anal contraction (Yes/No) ☐

KEY SENSORY POINTS

Light Touch (LTR) Pin Prick (PPR)

C2		
C3		
C4		
C5		
C6		
C7		
C8		
T1		
T2		
T3		
T4		
T5		
T6		
T7		
T8		
T9		
T10		
T11		
T12		
L1		
L2		
L3		
L4		
L5		
S1		
S2		
S3		
S4-5		

RIGHT TOTALS
(MAXIMUM) (50) (56) (56)

LEFT

KEY MUSCLES

UEL
(Upper Extremity Left)

Elbow flexors C5

Wrist extensors C6

Elbow extensors C7

Finger flexors C8

Finger abductors (little finger) T1

LEL
(Lower Extremity Left)

Hip flexors L2

Knee extensors L3

Ankle dorsiflexors L4

Long toe extensors L5

Ankle plantar flexors S1

(DAP) Deep anal pressure (Yes/No) ☐

KEY SENSORY POINTS

Light Touch (LTL) Pin Prick (PPL)

C2		
C3		
C4		
C5		
C6		
C7		
C8		
T1		
T2		
T3		
T4		
T5		
T6		
T7		
T8		
T9		
T10		
T11		
T12		
L1		
L2		
L3		
L4		
L5		
S1		
S2		
S3		
S4-5		

LEFT TOTALS
(MAXIMUM) (56) (56) (50)

MOTOR SUBSCORES

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

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

SENSORY SUBSCORES

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

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

NEUROLOGICAL LEVELS

Steps 1-5 for classification: AS 10/10/1992

1. SENSORY

2. MOTOR

3. NEUROLOGICAL LEVEL OF INJURY (NL)

4. COMPLETE OR INCOMPLETE? ☐

Incomplete = Any sensory or motor function in S4-5

5. ASIA IMPAIRMENT SCALE (AIS)

(In complete injuries only)

ZONE OF PARTIAL PRESERVATION

Must occur level with any preservation

SENSORY

MOTOR

AMERICA SPINAL CORD ASSOCIATION (ASIA) SCORING SHEET

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 functional muscle position expected from an otherwise unimpaired person.
5 = (normal) active movement, full ROM against gravity and full resistance in a functional muscle position expected from an otherwise unimpaired person.
5* = (normal) active movement, full ROM against gravity and sufficient resistance to be considered normal if identified inhibiting factors (i.e. pain, clonus) were not present.
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 range of motion).

Sensory Grading

- 0** = Absent
1 = Altered, either decreased/impaired sensation or hypersensitivity
2 = Normal
NT = Not testable

Non Key Muscle Functions (optional)

May be used to assign a motor level to differentiate AIS B vs. C

Movement	Root level
Shoulder: Flexion, extension, abduction, adduction, internal and external rotation	C5
Elbow: Supination	
Elbow: Pronation	C6
Wrist: Flexion	
Finger: Flexion at proximal joint, extension	C7
Thumb: Flexion, extension and abduction in plane of thumb	
Finger: Flexion at MCP joint	C8
Thumb: Opposition, adduction and abduction perpendicular to palm	
Finger: Abduction of the index finger	T1
Hip: Adduction	L2
Hip: External rotation	L3
Hip: Extension, abduction, internal rotation	L4
Knee: Flexion	
Ankle: Inversion and eversion	
Toe: MP and P extension	
Hallux and Toe: DP and PP 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 below the neurological level*, and at least half (half or more) of key muscle functions below the neurological level of injury (NLI) have a muscle grade less than 3 (Grades 0-2).

D = Motor incomplete. Motor function is preserved below the neurological level**, and at least half (half or more) of key muscle functions below the NLI have 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.

** For an individual to receive a grade of C or D, i.e. motor incomplete status, they must have either (1) voluntary anal sphincter contraction or (2) sacral sensory sparing with sparing of motor function more than three levels below the motor level for that side of the body. The International Standards at this time allow even non-key muscle function more than 3 levels below the motor level to be used in determining motor incomplete status (AIS B versus C).

NOTE: When assessing the extent of motor sparing below the level for distinguishing between AIS B and C, the **motor level** on each side is used, whereas to differentiate between AIS C and D (based on proportion of key muscle functions with strength grade 3 or greater) the **neurological level of injury** is used.

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?

NO
↓

If YES, AIS=A and can record ZPP (lowest dermatome or myotome on each side with some preservation)

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; the ASIA Impairment Scale does not apply.



SCIM-SPINAL CORD INDEPENDENCE MEASURE

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LOEWENSTEIN HOSPITAL REHABILITATION CENTER

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Department IV, Medical Director: Dr. Amiram Catz Tel: 972-9-7709090 Fax: 972-9-7709986 e-mail: amiramc@clalit.org.il

Patient Name: ID: Examiner Name:

(Enter the score for each function in the adjacent square, below the date. The form may be used for up to 6 examinations.)

SCIM-SPINAL CORD INDEPENDENCE MEASURE

Version III, Sept 14, 2002

Self-Care

DATE

Exam 1 2 3 4 5 6

1. Feeding (cutting, opening containers, pouring, bringing food to mouth, holding cup with fluid)

- 0. Needs parenteral, gastrostomy, or fully assisted oral feeding
- 1. Needs partial assistance for eating and/or drinking, or for wearing adaptive devices
- 2. Eats independently; needs adaptive devices or assistance only for cutting food and/or pouring and/or opening containers
- 3. Eats and drinks independently; does not require assistance or adaptive devices

2. Bathing (soaping, washing, drying body and head, manipulating water tap). A-upper body; B-lower body

- A. 0. Requires total assistance
- 1. Requires partial assistance
- 2. Washes independently with adaptive devices or in a specific setting (e.g., bars, chair)
- 3. Washes independently; does not require adaptive devices or specific setting (not customary for healthy people) (adss)
- B. 0. Requires total assistance
- 1. Requires partial assistance
- 2. Washes independently with adaptive devices or in a specific setting (adss)
- 3. Washes independently; does not require adaptive devices (adss) or specific setting

- 3. Dressing (clothes, shoes, permanent orthoses: dressing, wearing, undressing). A-upper body; B-lower body
- A. 0. Requires total assistance
- 1. Requires partial assistance with clothes without buttons, zippers or laces (cwobzl)
- 2. Independent with cwobzl; requires adaptive devices and/or specific settings (adss)
- 3. Independent with cwobzl; does not require adss; needs assistance or adss only for bzl
- 4. Dresses (any cloth) independently; does not require adaptive devices or specific setting

- B. 0. Requires total assistance
- 1. Requires partial assistance with clothes without buttons, zips or laces (cwobzl)
- 2. Independent with cwobzl; requires adaptive devices and/or specific settings (adss)
- 3. Independent with cwobzl without adss; needs assistance or adss only for bzl
- 4. Dresses (any cloth) independently; does not require adaptive devices or specific setting

- 4. Grooming (washing hands and face, brushing teeth, combing hair, shaving, applying makeup)
- 0. Requires total assistance
- 1. Requires partial assistance
- 2. Grooms independently with adaptive devices
- 3. Grooms independently without adaptive devices

SUBTOTAL (0-20)

Respiration and Sphincter Management

5. Respiration

- 0. Requires tracheal tube (TT) and permanent or intermittent assisted ventilation (IAV)
- 2. Breathes independently with TT; requires oxygen, much assistance in coughing or TT management
- 4. Breathes independently with TT; requires little assistance in coughing or TT management
- 6. Breathes independently without TT; requires oxygen, much assistance in coughing, a mask (e.g., pcp) or IAV (bipap)
- 8. Breathes independently without TT; requires little assistance or stimulation for coughing
- 10. Breathes independently without assistance or device

6. Sphincter Management - Bladder

- 0. Indwelling catheter
- 3. Residual urine volume (RUV) > 100cc; no regular catheterization or assisted intermittent catheterization
- 6. RUV < 100cc or intermittent self-catheterization; needs assistance for applying drainage instrument
- 9. Intermittent self-catheterization; uses external drainage instrument; does not need assistance for applying
- 11. Intermittent self-catheterization; continent between catheterizations; does not use external drainage instrument
- 13. RUV < 100cc; needs only external urine drainage; no assistance is required for drainage
- 15. RUV < 100cc; continent; does not use external drainage instrument

7. Sphincter Management - Bowel

- 0. Irregular timing or very low frequency (less than once in 3 days) of bowel movements
- 5. Regular timing, but requires assistance (e.g., for applying suppository); rare accidents (less than twice a month)
- 8. Regular bowel movements, without assistance; rare accidents (less than twice a month)
- 10. Regular bowel movements, without assistance; no accidents

8. Use of Toilet (perineal hygiene, adjustment of clothes before/after, use of napkins or diapers).

- 0. Requires total assistance
- 1. Requires partial assistance; does not clean self
- 2. Requires partial assistance; cleans self independently
- 4. Uses toilet independently in all tasks but needs adaptive devices or special setting (e.g., bars)
- 5. Uses toilet independently; does not require adaptive devices or special setting

SUBTOTAL (0-40)

Mobility (room and toilet)

DATE

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9. Mobility in Bed and Action to Prevent Pressure Sores

0. Needs assistance in all activities: turning upper body in bed, turning lower body in bed, sitting up in bed, doing push-ups in wheelchair, with or without adaptive devices, but not with electric aids
2. Performs one of the activities without assistance
4. Performs two or three of the activities without assistance
6. Performs all the bed mobility and pressure release activities independently

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10. Transfers: bed-wheelchair (locking wheelchair, lifting footrests, removing and adjusting arm rests, transferring, lifting feet).

0. Requires total assistance
1. Needs partial assistance and/or supervision, and/or adaptive devices (e.g., sliding board)
2. Independent (or does not require wheelchair)

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11. Transfers: wheelchair-toilet-tub (if uses toilet wheelchair: transfers to and from; if uses regular wheelchair: locking wheelchair, lifting footrests, removing and adjusting armrests, transferring, lifting feet)

0. Requires total assistance
1. Needs partial assistance and/or supervision, and/or adaptive devices (e.g., grab-bars)
2. Independent (or does not require wheelchair)

Mobility (indoors and outdoors, on even surface)**12. Mobility Indoors**

0. Requires total assistance
1. Needs electric wheelchair or partial assistance to operate manual wheelchair
2. Moves independently in manual wheelchair
3. Requires supervision while walking (with or without devices)
4. Walks with a walking frame or crutches (swing)
5. Walks with crutches or two canes (reciprocal walking)
6. Walks with one cane
7. Needs leg orthosis only
8. Walks without walking aids

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13. Mobility for Moderate Distances (10-100 meters)

0. Requires total assistance
1. Needs electric wheelchair or partial assistance to operate manual wheelchair
2. Moves independently in manual wheelchair
3. Requires supervision while walking (with or without devices)
4. Walks with a walking frame or crutches (swing)
5. Walks with crutches or two canes (reciprocal walking)
6. Walks with one cane
7. Needs leg orthosis only
8. Walks without walking aids

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14. Mobility Outdoors (more than 100 meters)

0. Requires total assistance
1. Needs electric wheelchair or partial assistance to operate manual wheelchair
2. Moves independently in manual wheelchair
3. Requires supervision while walking (with or without devices)
4. Walks with a walking frame or crutches (swing)
5. Walks with crutches or two canes (reciprocal walking)
6. Walks with one cane
7. Needs leg orthosis only
8. Walks without walking aids

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15. Stair Management

0. Unable to ascend or descend stairs
1. Ascends and descends at least 3 steps with support or supervision of another person
2. Ascends and descends at least 3 steps with support of handrail and/or crutch or cane
3. Ascends and descends at least 3 steps without any support or supervision

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16. Transfers: wheelchair-car (approaching car, locking wheelchair, removing arm- and footrests, transferring to and from car, bringing wheelchair into and out of car)

0. Requires total assistance
1. Needs partial assistance and/or supervision and/or adaptive devices
2. Transfers independent; does not require adaptive devices (or does not require wheelchair)

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17. Transfers: ground-wheelchair

0. Requires assistance
1. Transfers independent with or without adaptive devices (or does not require wheelchair)

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SUBTOTAL (0-40)

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TOTAL SCIM SCORE (0-100)

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WALKING INDEX FOR SPINAL CORD

Appendix

Walking Index for Spinal Cord Injury (WISCI II)

Physical limitation for walking secondary to impairment is defined at the person level and indicates the ability of a person to walk after spinal cord injury. The development of this assessment index required a rank ordering along a dimension of impairment, from the level of most severe impairment (0) to least severe impairment (20) based on the use of devices, braces and physical assistance of one or more persons. The order of the levels suggests each successive level is a less impaired level than the former. The ranking of severity is based on the severity of the impairment and not on functional independence in the environment. The following definitions standardize the terms used in each item:

Physical assistance: 'Physical assistance of two persons' is moderate to maximum assistance.
'Physical assistance of one person' is minimal assistance.

Braces: 'Braces' means one or two braces, either short or long leg.
(Splinting of lower extremities for standing is considered long leg bracing).
'No braces' means no braces on either leg.

Walker: 'Walker' is a conventional rigid walker without wheels.

Crutches: 'Crutches' can be Lofstrand (Canadian) or axillary.

Cane: 'Cane' is a conventional straight cane.

Level	Description
0	Client is unable to stand and/or participate in assisted walking.
1	Ambulates in parallel bars, with braces and physical assistance of two persons, less than 10 meters.
2	Ambulates in parallel bars, with braces and physical assistance of two persons, 10 meters.
3	Ambulates in parallel bars, with braces and physical assistance of one person, 10 meters.
4	Ambulates in parallel bars, no braces and physical assistance of one person, 10 meters.
5	Ambulates in parallel bars, with braces and no physical assistance, 10 meters.
6	Ambulates with walker, with braces and physical assistance of one person, 10 meters.
7	Ambulates with two crutches, with braces and physical assistance of one person, 10 meters.
8	Ambulates with walker, no braces and physical assistance of one person, 10 meters.
9	Ambulates with walker, with braces and no physical assistance, 10 meters.
10	Ambulates with one cane/crutch, with braces and physical assistance of one person, 10 meters.
11	Ambulates with two crutches, no braces and physical assistance of one person, 10 meters.
12	Ambulates with two crutches, with braces and no physical assistance, 10 meters.
13	Ambulates with walker, no braces and no physical assistance, 10 meters.
14	Ambulates with one cane/crutch, no braces and physical assistance of one person, 10 meters.
15	Ambulates with one cane/crutch, with braces and no physical assistance, 10 meters.
16	Ambulates with two crutches, no braces and no physical assistance, 10 meters.
17	Ambulates with no devices, no braces and physical assistance of one person, 10 meters.
18	Ambulates with no devices, with braces and no physical assistance, 10 meters.
19	Ambulates with one cane/crutch, no braces and no physical assistance, 10 meters.
20	Ambulates with no devices, no braces and no physical assistance, 10 meters.

Scoring Sheet (WISCI II)**Patient Name** _____ **Date** _____

Check descriptors which apply to current walking performance, then assign the highest level of walking performance. (In scoring a level, one should choose the level at which the patient is safe as judged by the therapist, with patient's comfort level described. If devices other than stated in the standard definitions are used, they should be documented as descriptors. If there is a discrepancy between two observers, the higher level should be chosen.)

Descriptors

Gait: reciprocal ____; swing through ____


Devices	Braces	Assistance	Patient reported comfort level
// bars < 10 mtrs	Long Leg Braces- Uses 2 Uses 1	Max assist x 2 people	Very comfortable
//bars 10 mtrs	Short Leg Braces- Uses 2 Uses 1	Min/Mod assist x 2 people	Slightly comfortable
Walker- Standard Rolling Platform	Locked at knee _____ Unlocked at knee _____	Min/Mod assist x 1 person	Neither comfortable nor uncomfortable
Crutches- Uses 2 Uses 1	Other: _____		Slightly uncomfortable
Canes- Quad Uses 2 Uses 1			Very Uncomfortable
No devices	No braces	No assistance	

WISCI Levels

Level	Devices	Braces	Assistance	Distance
0				Unable
1	Parallel bars	Braces	2 persons	Less than 10 meters
2	Parallel bars	Braces	2 persons	10 meters
3	Parallel bars	Braces	1 person	10 meters
4	Parallel bars	No braces	1 person	10 meters
5	Parallel bars	Braces	No assistance	10 meters
6	Walker	Braces	1 person	10 meters
7	Two crutches	Braces	1 person	10 meters
8	Walker	No braces	1 person	10 meters
9	Walker	Braces	No assistance	10 meters
10	One cane/crutch	Braces	1 person	10 meters
11	Two crutches	No braces	1 person	10 meters
12	Two crutches	Braces	No assistance	10 meters
13	Walker	No braces	No assistance	10 meters
14	One cane/crutch	No braces	1 person	10 meters
15	One cane/crutch	Braces	No assistance	10 meters
16	Two crutches	No braces	No assistance	10 meters
17	No devices	No braces	1 person	10 meters
18	No devices	Braces	No Assistance	10 meters
19	One cane/crutch	No braces	No assistance	10 meters
20	No devices	No braces	No assistance	10 meters

Level assigned _____

NRS SCORE CARDS

Neuromuscular Recovery Scale Adult Version 2019					
Sit					
Instructions: "We are going to assess your ability to sit. Sit up tall with your best posture without using your hands."					
1A	Unable to maintain proper posture of trunk	1B	Unable to attain. Able to sit with inappropriate posture and positioning.	1C	Unable to attain. Able to maintain sitting with appropriate posture of head, shoulders, and trunk.
2A	Able to attain appropriate head, shoulder, and trunk posture and pelvis positioning and maintain for at least approximately one minute.	2B	Able to attain and hold appropriate head, shoulder, and trunk posture and pelvis positioning and maintain indefinitely.	2C	Sit with appropriate posture of the head, shoulders and trunk and positioning of the pelvis with arms parallel to legs for at least 30 seconds.
3A	Sit with proper posture of the head, shoulders and trunk and position of the pelvis with forward and lateral reach <5 inches.	3B	Sit with proper posture of the head, shoulders and trunk and position of the pelvis with forward and lateral reach between approximately 5–10 inches.	3C	Sit with proper posture of the head, shoulders and trunk and position of the pelvis with forward and lateral reach >10 inches.
4A	Able to attain and hold appropriate head, shoulder, and trunk posture and pelvis positioning indefinitely. Able to elevate arms out-stretched parallel to legs with 90 degrees of shoulder flexion and appropriate kinematics of the scapulae, shoulder and elbow inappropriate wrist and fingers.	4B	Sit with proper posture of the head, shoulders and trunk and position of the pelvis with forward and lateral reach >10 inches, with appropriate kinematics of the scapulae, shoulders, elbows, and inappropriate kinematics of the wrist and fingers.	4C	Sit with proper posture of the head, shoulders and trunk and position of the pelvis with forward and lateral reach >10 inches, with appropriate kinematics of the scapulae, shoulders, elbows, wrists and fingers.

Reverse Sit-up					
	Instructions: "We are going to assess reverse sit-up. Lower yourself to the mat in a controlled manner with your arms elevated."				
1A	NOT APPLICABLE	1B	NOT APPLICABLE	1C	Unable to lower his or her trunk from a sitting position to a supine position in a controlled manner with appropriate kinematics of the head, shoulders and trunk.
2A	Able to lower his or her trunk from a sitting position through the first quarter in a controlled manner with appropriate kinematics of the head, shoulders, and trunk, but loses control during the last three quarters.	2B	Able to lower his or her trunk throughout the first 45 degrees (half-way) in a controlled manner with appropriate posterior pelvic tilt , but loses control during the second half.	2C	Able to lower his or her trunk three quarters of way in a controlled manner with appropriate posterior pelvic tilt, but loses control during the last one quarter (1/4) .
3A	Able to slowly lower his or her trunk onto the mat in a controlled manner using elevated arms to provide a counterbalance and/or knee extension and/or significant hip flexion.	3B	With arms across chest , able to slowly lower his or her trunk onto the mat in a controlled manner (with appropriate kinematics of head, shoulders, trunk, and pelvis) with knee extension or significant hip flexion.	3C	With arms across chest, able to slowly lower his or her trunk onto the mat in a controlled manner (with appropriate kinematics of head, shoulders, trunk, and pelvis) with significant effort without knee extension or significant hip flexion.
4A	With arms across chest, able to slowly lower his or her trunk onto the mat in a controlled manner with appropriate kinematics without significant effort.	4B	With arms across chest, able to slowly lower his or her trunk half way toward the mat in a controlled manner without significant effort, then rotate trunk left and right and return to sitting.	4C	With arms across chest, able to slowly lower his or her trunk half way toward the mat in a controlled manner without significant effort, then rotate trunk left and right and return to sitting without resting on the mat.

Sit-up					
Instructions: "We are going to assess sit-up. With arms elevated, return to an upright sitting position at edge of mat."					
1A	With shoulders in flexion, unable to raise his or her head off of the mat.	1B	With shoulders in flexion, able to raise his or her head off of the mat.	1C	With shoulders in flexion, able to raise his or her head and initiate raising shoulders off of the mat.
2A	With shoulders in flexion, able to raise his or her head and initiate raising unilateral scapula off of mat with palpable contraction of external oblique or spine of scapula clears the mat.	2B	With shoulders in flexion, able to raise his or her head and shoulders so that bilateral scapula (at the same time) are off of the mat with palpable contraction of external oblique or spines of scapula clear the mat.	2C	With shoulders in flexion, able to raise his or her head and unilateral shoulder so that the inferior angle of the scapula is off of the mat.
3A	With shoulders in flexion, able to raise his or her head and shoulders so that bilateral inferior angle of the scapulae are off of the mat with posterior tilt of the pelvis.	3B	With arms across chest, able to raise his or her head and shoulders so that bilateral inferior angles of the scapulae are off of the mat with posterior tilt of the pelvis held for 5 seconds.	3C	With shoulders in flexion, able to raise head, shoulders, and trunk off of the mat and assume a sitting position by using elevated arms to provide a counter-balance and/or knee extension and/or significant hip flexion.
4A	With arms across chest, able to raise head, shoulders, and trunk off of the mat and assume a sitting position by using elevated arms to provide a counter-balance and/or knee extension and/or significant hip flexion.	4B	With arms across chest, able to raise head, shoulders, and trunk off of the mat and assume a sitting position with significant effort without knee extension or significant hip flexion.	4C	With arms across chest, able to raise head, shoulders, and trunk off of the mat and assume a sitting position in a controlled manner without significant effort.

Trunk Extension in Sitting					
Instructions: "We are going to assess trunk extension. Please return to an upright sitting position without using your hands."					
1A	With arms hanging down, unable to initiate thoracic spine extension.	1B	With arms hanging down able to initiate thoracic spine extension.	1C	With arms hanging down, able to initiate & maintain thoracic spine extension.
2A	With arms hanging down, able to initiate & maintain thoracic spine extension & can initiate lumbar spine extension.	2B	In 45 degrees of forward flexion can return to sitting with appropriate thoracic extension.	2C	With arms hanging down, able to return to sitting with inappropriate trunk kinematics with significant effort.
3A	With arms hanging down, able to return to sitting while maintaining thoracic & lumbar spine extension with significant effort.	3B	With arms hanging down, able to return to sitting while maintaining lumbar & thoracic spine extension without significant effort.	3C	With hands behind head , able to return to sitting while maintaining lumbar & thoracic spine extension with significant effort.
4A	With hands behind head, able to return to sitting while maintaining lumbar & thoracic spine extension without significant effort.	4B	With hands behind head, able to lower trunk to knees return to sitting while maintaining lumbar & thoracic spine extension in controlled manner with significant effort.	4C	With hands behind head, able to lower trunk to knees return to sitting while maintaining lumbar & thoracic spine extension in controlled manner without significant effort.

Overhead Press					
Instructions: "We are going to assess overhead press. Sit up tall with your best posture, with your hand down at your side. Curl your hand toward your shoulder, turn your hand out, then press your hand toward the ceiling while straightening your elbow."					
1A	Unable	1B	Able to initiate elbow flexion, unable to initiate arm overhead.	1C	Able to achieve elbow flexion with inappropriate kinematics, unable to initiate overhead press.
2A	Able to achieve full elbow flexion with appropriate kinematics, and initiate shoulder flexion and initiate elbow extension.	2B	Same as 2A and initiate scapula upward rotation and full forearm pronation.	2C	Same as 2B and able to raise elbow above shoulder level.
3A	Same as 2C and achieve full elbow extension and full shoulder flexion with inappropriate kinematics.	3B	Same as 3A and achieve full elbow extension and full shoulder flexion and scapular upward rotation with appropriate kinematics.	3C	Same as 3B and holding dumbbell (1lb) with inappropriate kinematics of wrist and fingers, for 30 seconds.
4A	Same as 3C and hold dumbbell (3lb) with appropriate kinematics of wrist and inappropriate kinematics of fingers.	4B	Same as 4A with appropriate kinematics of wrist and fingers.	4C	Able to achieve full elbow flexion, forearm pronation, raise arm above head with full shoulder flexion and full elbow extension holding a dumbbell (5lb) with appropriate kinematics of wrist and grasp.

Shoulder Flexion					
Instructions: "We are going to assess shoulder flexion. Sit up tall with your best posture. Please raise your arm out in front of you to shoulder level, keeping your elbow straight. Then turn your palm up, so that your thumb is pointing towards the sky, then raise your arm as high as you can, while keeping your other arm down at your side."					
1A	Unable	1B	Initiate scapular stabilization.	1C	Perform scapular stabilization, initiate shoulder flexion all with inappropriate kinematics .
2A	Perform scapular stabilization and shoulder flexion to move arm to 45 degrees all with inappropriate kinematics.	2B	Perform 2A and initiate elbow extension with inappropriate kinematics .	2C	Perform scapular stabilization and shoulder flexion to move arm to 45 degrees all with appropriate shoulder kinematics and maintain elbow extension .
3A	Perform scapular stabilization and shoulder flexion to 90 degrees with elbow extension with inappropriate kinematics.	3B	Perform scapular stabilization, shoulder flexion with full elbow extension to move arm to 90 degrees all with appropriate kinematics.	3C	3B then perform supination to neutral position (thumb up) and raise arm above shoulder level with inappropriate kinematics .
4A	3C and maintain full shoulder flexion with elbow extension all with appropriate kinematics.	4B	Perform scapular stabilization and full shoulder flexion , while holding a 3lb weight with inappropriate wrist and finger kinematics .	4C	Perform scapular stabilization with full shoulder flexion with 3lb weight all with appropriate kinematics .

Grasp					
Instructions: "We are going to assess grasp. Sit up tall with your best posture, with your hand being assessed on the table palm down and your other arm at your side. Grab this can, bring it to your mouth, and set it back down on the table. I can help position your hand on the table if you need assistance."					
1A	Unable	1B	Initiate wrist extension.	1C	Perform wrist extension and initiate supination to neutral with inappropriate kinematics.
2A	Perform wrist extension and supination to neutral with appropriate kinematics. Initiate finger and thumb extension then finger and thumb flexion with inappropriate kinematics.	2B	Place hand to empty can with appropriate wrist kinematics and extend all fingers/thumb to empty can width with inappropriate kinematics.	2C	Grasp empty can with inappropriate kinematics of finger flexion while maintaining neutral wrist position with appropriate kinematics.
3A	Maintains grasp on can, without can sliding with inappropriate kinematics of finger flexion.	3B	3A and lifts empty can to mouth with inappropriate finger kinematics.	3C	Lift empty can to his or her mouth with appropriate kinematics of finger and wrist flexion/extension balance to grasp and squeeze the can.
4A	Move empty can from his or her mouth and place back on table at any speed releasing with inappropriate kinematics.	4B	Move empty can from his or her mouth and place back on table with appropriate kinematics and at appropriate speed and release with extension of fingers.	4C	Same as 4B and grab and lift full can to his or her mouth with finger flexion and place back on table with appropriate kinematics and at appropriate speed and release with extension of fingers.

Door Pull					
Instructions: "We are going to assess door pull. Sit up tall with your best posture. Start with your hand resting on the table, then pull your hand back to the side of your body as if opening a door."					
1A	Unable	1B	Initiate scapular stabilization and shoulder extension to pull arm backward with inappropriate kinematics.	1C	Initiate scapular stabilization, shoulder extension and elbow movement to pull hand backward with inappropriate kinematics.
2A	Initiate scapular stabilization to pull hand backward until the hand reaches the side of the trunk with inappropriate kinematics.	2B	Perform scapular stabilization to pull the hand backwards until the hand reaches the side of the trunk with appropriate kinematics (including the scapula).	2C	Initiate pronation and supination with inappropriate kinematics , then 2B.
3A	Perform pronation and supination with appropriate kinematics.	3B	Perform 3lb dumbbell grasp with inappropriate wrist and finger kinematics.	3C	Pull 3lb dumbbell backwards with inappropriate wrist and finger kinematics until it reaches the side of the trunk.
4A	Perform 3lb dumbbell grasp and pull backwards until it reaches the side of the trunk all with appropriate wrist and finger kinematics.	4B	Perform pronation and supination with appropriate kinematics , while holding the 3lb dumbbell.	4C	4B while holding 5lb dumbbell.

Open with Key

Instructions: "We are going to assess your ability to open a lock with a key. Sit up tall with your best posture. Start with your hand resting on the table, with your thumb pointing towards the sky. Pick up the key using your thumb and index finger, turn the key in your hand so that it is positioned between your thumb and the side of your index finger. Then insert it into the lock. I can help you position your hand if you need assistance."

1A	Unable	1B	Initiate finger flexion and initiate wrist extension to attempt tip to tip pinch.	1C	Use wrist extension and finger flexion to pick up key with inappropriate kinematics.
2A	Use wrist extension and finger flexion to pick up key with appropriate tip to tip pinch.	2B	Initiate translation of the key from tip to tip pinch to lateral key pinch in hand.	2C	Perform translation of the key from tip to tip pinch to lateral key pinch in hand.
3A	Able to pick up key , perform translation of key and insert into lock with inappropriate kinematics.	3B	Able to pick up key, perform translation of key and insert into the lock all with appropriate kinematics.	3C	3B and turn the key 90 degrees by supinating and pronating forearm with inappropriate kinematics.
4A	Able to pick up key , insert in lock and turn the key 90 degrees by supinating and pronating forearm with appropriate kinematics at any speed.	4B	Able to pick up key, insert in lock and turn the key 90 degrees by supinating and pronating forearm with appropriate kinematics at normal speed.	4C	Perform 4B then remove key and place on table with appropriate kinematics at normal speed.

Can Open and Manipulation			
Instructions: "We are going to assess can open and manipulation. Sit up with your best posture and your arms at your side. Simultaneously reach and place both hands around the container, with your hands in a "C" position (thumbs are around the can, not next to the index fingers)." 			
1A	Unable	1B	Scapular stabilization, shoulder flexion, elbow movement to place BUEs forward towards lap with inappropriate kinematics (can be performed asymmetrically).
2A	Reach bilateral hands to midline with appropriate kinematics (can be performed asymmetrically).	2B	Lift bilateral hands up off lap towards edge of table simultaneously with appropriate kinematics.
3A	Same as 2C and initiate finger extension with appropriate kinematics to place bilateral hands around can ("C" hand position) to empty container width. <u>Score hands together through 3A.</u>	3B	Maintain one hand around can appropriately and release other hand placing on lid with inappropriate kinematics. <u>Begin scoring each UE individually.</u>
4A	Same as 3C and reach into can with appropriate kinematics. Initiate grasp of items in hand inappropriately.	4B	Grasp a hand full of items appropriately and lift hand out of can with appropriate kinematics.
		4C	4B and translate items individually to tips of fingers and be able to repeat this task 3 times while maintaining appropriate speed and kinematics.

Sit to Stand					
Instructions: "We are going to assess sit to stand. Please try to stand up without using your hands."					
1A	Not applicable	1B	Unable to transition from sit to stand. Trainers do not provide manual facilitation for the head, shoulders, trunk, pelvis, knees, or ankles.	1C	Able to initiate weight bearing on legs in an attempt to transition from sit to stand, but unable to raise his or her body off the mat.
2A	Able to initiate weight bearing on the legs and raise his or her body off the mat (less than 50% upright) during the transition from sit to stand with inappropriate kinematics of the head, shoulders, and or trunk.	2B	Able to transition from sit to stand with appropriate kinematics of the head, shoulders, and trunk. Trainers do not provide manual facilitation for the head, shoulders, or trunk.	2C	Able to transition from sit to stand with appropriate kinematics of the head, shoulders, and trunk and positioning of the pelvis using counterbalance of arms during the transition from sit to stand.
3A	Able to transition from sit to stand with appropriate kinematics of the trunk and position of the pelvis and inappropriate kinematics of the knees and ankles using counterbalance of arms during the transition from sit to stand.	3B	Sitting on edge of mat or chair with feet on the floor and hips at 80 degrees of flexion raises self into an upright position with appropriate kinematics of the trunk and position of the pelvis and kinematics of the knees and ankles using counterbalance of arms during the transition from sit to stand.	3C	Able to transition from sit to stand sitting on edge of mat or chair with feet on the floor and hips at 90 degrees of flexion; raises self into upright position with appropriate kinematics of the trunk and position of the pelvis and kinematics of the knees and ankles using counterbalance of arms during the transition from sit to stand.
4A	Sitting on edge of mat with feet on the floor steadily raises self into an upright position with appropriate kinematics of the head, shoulders, trunk, pelvis, knees, and ankles and without using arms as a counterbalance.	4B	Able to steadily transition from sit to stand with appropriate kinematics of head, shoulders, trunk, pelvis, knees and ankles while holding 20# weighted bag.	4C	Sitting on edge of mat or chair with feet on the floor and hips at 100 degrees of flexion steadily raises into an upright position with appropriate kinematics of the head, shoulders, trunk, pelvis, knees, and ankles and without significant effort, and without using arms as counterbalance.

Stand					
Instructions: "We are going to assess your ability to stand. Stand with your best posture without using your hands or an assistive device. I will assist you into standing if you need help."					
1A	Not applicable	1B	Unable to maintain standing over ground with proper posture of head, shoulders, and trunk and positioning of pelvis, knees, and ankles.	1C	Able to stand with inappropriate posture of the head, shoulders, and trunk.
2A	Able to stand with appropriate posture of trunk using arms for counter balance for <1 minute.	2B	Able to maintain standing with appropriate posture of trunk and position of pelvis using arms for counter balance for <1 minute.	2C	Able to maintain standing with appropriate posture of trunk and position of pelvis using arms for a counter balance for at least one minute.
3A	Able to maintain standing with proper trunk posture and position of pelvis and legs using arms for a counter balance for < 1 minute.	3B	Able to maintain standing with proper trunk posture and position of pelvis and legs indefinitely.	3C	Able to maintain standing with proper trunk posture and position of pelvis and legs and reach/lean in all directions >10 inches.
4A	Able to maintain standing with proper trunk posture and position of pelvis and legs during anterior, lateral, and posterior perturbations at the trunk with displacement of no more than 2 inches.	4B	Able to achieve and maintain tandem stance position (both legs) for 30 seconds.	4C	Able to achieve and maintain single limb stance (both legs) for 30 seconds.

Walking					
Instructions: "We are going to assess your ability to walk. While standing with your best posture, without using your hands, shift your weight side to side moving your shoulders and hips together."					
1A	Not Applicable	1B	Not applicable	1C	Not applicable
2A	Unable to shift body weight laterally (side to side).	2B	Able to shift body weight laterally (side to side) with inappropriate kinematics of head, shoulders, and/or trunk.	2C	Able to shift body weight laterally (side to side) and back and forth with appropriate kinematics of head, shoulders, and trunk. Unable to initiate the stride position with the right and/or left leg forward.
3A	Able to shift lateral (side to side) and in stride (back and forth) weight shift with appropriate kinematics of head, shoulders, and trunk and inappropriate kinematics of the legs. Able to initiate and complete stride with appropriate posture at trunk & inappropriate kinematics at legs.	3B	Able to shift lateral (side to side) and in stride (back and forth) weight shift with appropriate kinematics of head, shoulders, trunk, knee, and ankle.	3C	Same as 3B plus able to continue with repetitive steps with appropriate kinematics of head, shoulders, trunk, legs and arms.
4A	Individual is able to step over an object that is 24 inches long, 2 inches wide, and 4 inches high.	4B	Able to descend an incline maintaining normal overground walking speed. Able to complete a pivot turn without hesitation while maintaining balance.	4C	Able to run 10 meters with appropriate kinematics at trunk pelvis, legs and arms.

Stand Adaptability			
Instructions: "We are going to assess stand adaptability or standing independence. Please stand up tall with your best posture. We will be removing assist at different body segments starting with your trunk." (Start at 1A or end of stand retraining)			
1A	>60% BWS unable to maintain proper posture at head, shoulders, and trunk without manual facilitation.	1B	40–59% BWS maintain proper posture at head, shoulders and trunk without manual facilitation.
2A	10-19% BWS maintain proper posture at head, shoulders, and trunk without manual facilitation.	2B	>40% BWS maintain proper posture at head, shoulders, and trunk and positioning at pelvis without manual facilitation.
3A	10-19% BWS , maintain proper posture of trunk and pelvis during anterior, posterior and lateral perturbations .	3B	10-19% BWS maintain proper posture at head, shoulders, and trunk and positioning at pelvis during 10 squats .
4A	<10% , maintain proper posture of trunk and pelvis during anterior, posterior and lateral perturbations .	4B	<10% BWS , maintain proper posture at head, shoulders, and trunk and positioning at pelvis during 10 squats .
		4C	<10% BWS , the individual is able to maintain single limb stance on both lower extremities for 30 seconds.

Step Retraining					
Instructions: "We are going to assess step retraining. The trainers will be providing assistance to help you generate your best walking pattern. Keep your head up, shoulders back and try to swing your arms naturally." All of the subphases below are referring to the trainers ability to maintain proper kinematics.					
1A	Must remain >60% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	1B	Must remain between 55% and 59% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	1C	Must remain between 50% and 54% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.
2A	Must remain between 45% and 49% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	2B	Must remain between 40% and 44% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	2C	Must remain between 35% and 39% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.
3A	Must remain between 30% and 34% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	3B	Must remain between 20% and 29% BWS to generate the best stepping pattern with proper kinematics of the head, shoulders, trunk, pelvis, knees, and ankles.	3C	Must remain between 0% and 19% BWS to generate the best stepping pattern and maintain proper posture and kinematics.
4A	10% BWS at speeds >2.0 mph. Able to step over a 6" tall obstacle, leading with both the right and the left lower extremity.	4B	Able to adjust to varying speeds with <10% BWS.	4C	Able to sustain a running pattern with proper kinematics <25% BWS

Step Adaptability					
Instructions: "We are going to assess step adaptability or walking independence. We will be removing assist at different body segments starting with your trunk. Keep your head up, shoulders back and try to swing your arms naturally." (Start at 1A or slowdown from step retraining)					
1A	>60% BWS and treadmill speed 0.6 – 1.2 mph unable to maintain proper kinematics of head, shoulders, and trunk.	1B	40–59% BWS and treadmill speed 0.6-1.2 mph maintains proper kinematics of head, shoulders, and trunk.	1C	20–39% BWS, and treadmill speed 0.6-1.2 mph, maintains proper kinematics of head, shoulders, and trunk.
2A	<20% BWS, and treadmill speed 0.6-1.2 mph maintains proper kinematics of head, shoulders, and trunk.	2B	40–59% BWS, and treadmill speed 0.6-1.2 mph maintains proper kinematics of head, shoulders, trunk, and pelvis.	2C	20–39% BWS, and treadmill speed 0.6-1.2 mph maintains proper kinematics of head, shoulders, trunk, and pelvis.
3A	<20% BWS, treadmill speed 1.3-1.9 mph maintains proper kinematics of head, shoulders, trunk, and pelvis.	3B	<10% BWS, treadmill speed 1.3-1.9 mph, maintains proper leg kinematics and improper kinematics of arm swing.	3C	<10% BWS, treadmill speed ≥2.0 mph , maintains proper kinematics of head, shoulders, trunk, pelvis, hips, knees, ankles, and arm swing.
4A	<10% BWS, can always step over one object (2"height) at 1.0 mph leading with right and left leg.	4B	With BWS always <10%, can adjust to treadmill speeds that randomly vary between 1.0 and 3.0 mph, in at least 0.5 mph incre/decrements and able to maintain proper trunk,	4C	<10% BWS, treadmill speed necessary to initiate running , trunk, pelvis, and legs independent with appropriate arm swing.

