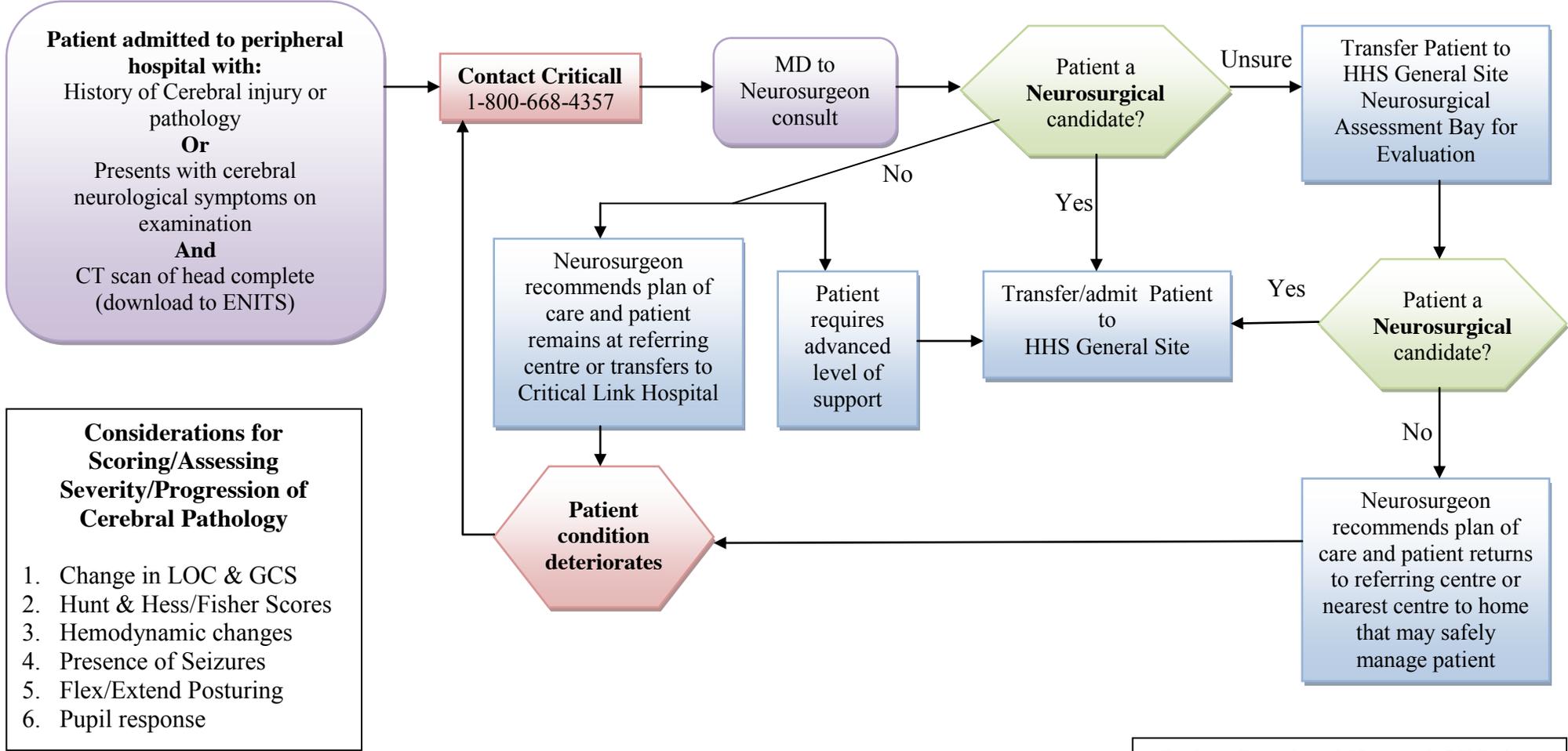


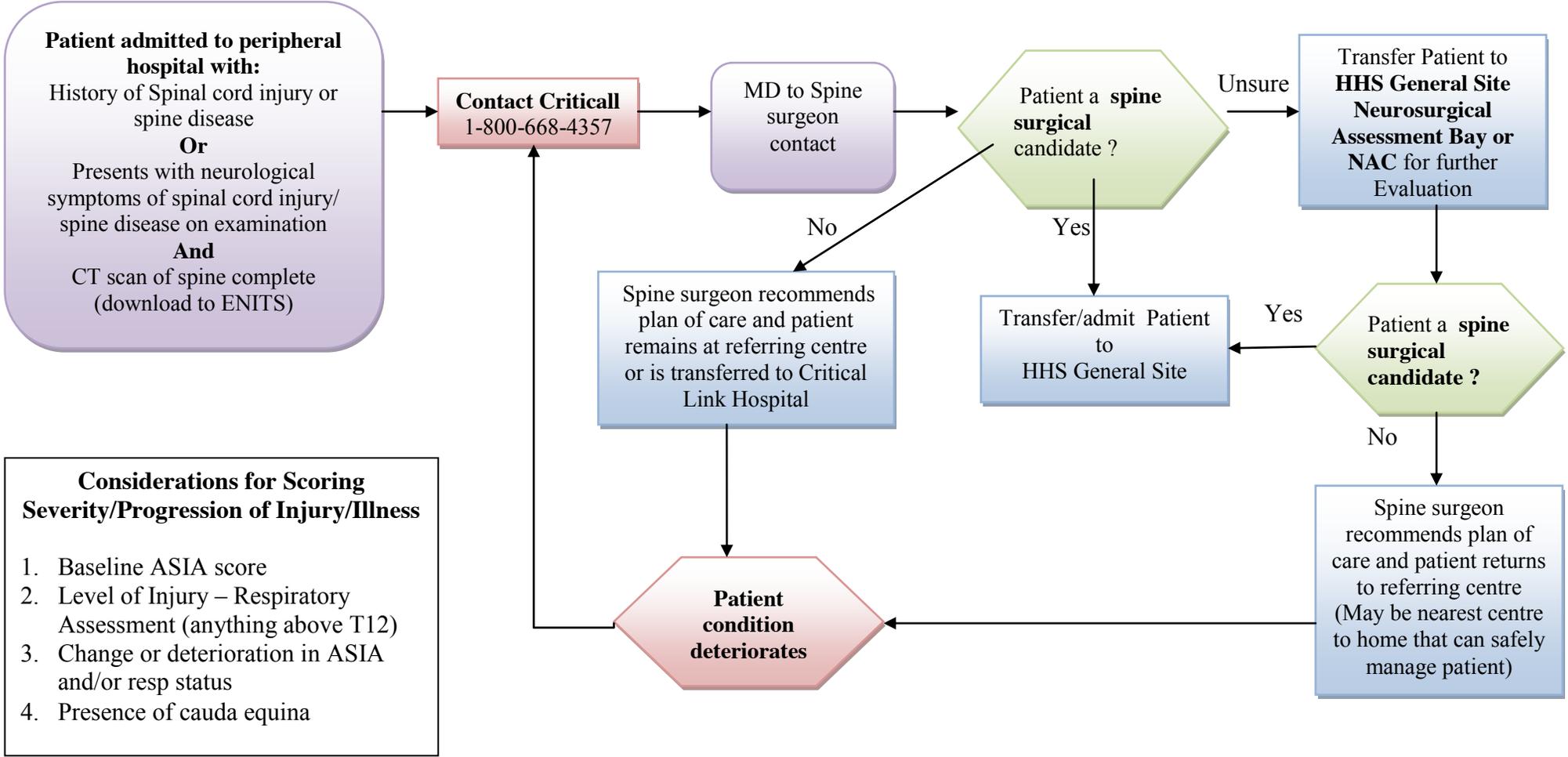
**Assessment & Triage Cerebral Neurosurgical Patients**



- Considerations for Scoring/Assessing Severity/Progression of Cerebral Pathology**
1. Change in LOC & GCS
  2. Hunt & Hess/Fisher Scores
  3. Hemodynamic changes
  4. Presence of Seizures
  5. Flex/Extend Posturing
  6. Pupil response

\*Link to Peripheral Hospital CT Policy

**Assessment & Triage Spine Surgical Patients**



- Considerations for Scoring Severity/Progression of Injury/Illness**
1. Baseline ASIA score
  2. Level of Injury – Respiratory Assessment (anything above T12)
  3. Change or deterioration in ASIA and/or resp status
  4. Presence of cauda equina

Patient Name \_\_\_\_\_

Examiner Name \_\_\_\_\_ Date/Time of Exam \_\_\_\_\_



# INTERNATIONAL STANDARDS FOR NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY



## MOTOR

KEY MUSCLES  
(scoring on reverse side)

- |    |                          |                          |  |
|----|--------------------------|--------------------------|--|
|    | R                        | L                        |  |
| C5 | <input type="checkbox"/> | <input type="checkbox"/> | Elbow flexors                                    |
| C6 | <input type="checkbox"/> | <input type="checkbox"/> | Wrist extensors                                  |
| C7 | <input type="checkbox"/> | <input type="checkbox"/> | Elbow extensors                                  |
| C8 | <input type="checkbox"/> | <input type="checkbox"/> | Finger flexors (distal phalanx of middle finger) |
| T1 | <input type="checkbox"/> | <input type="checkbox"/> | Finger abductors (little finger)                 |

UPPER LIMB TOTAL  
(MAXIMUM)  +  =   
(25) (25) (50)

Comments:

- |    |                          |                          |                       |
|----|--------------------------|--------------------------|-----------------------|
| L2 | <input type="checkbox"/> | <input type="checkbox"/> | Hip flexors           |
| L3 | <input type="checkbox"/> | <input type="checkbox"/> | Knee extensors        |
| L4 | <input type="checkbox"/> | <input type="checkbox"/> | Ankle dorsiflexors    |
| L5 | <input type="checkbox"/> | <input type="checkbox"/> | Long toe extensors    |
| S1 | <input type="checkbox"/> | <input type="checkbox"/> | Ankle plantar flexors |

(VAC) Voluntary anal contraction (Yes/No)

LOWER LIMB TOTAL  
(MAXIMUM)  +  =   
(25) (25) (50)

## LIGHT TOUCH

	R	L	R	L
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				

TOTALS {  +  =   
(MAXIMUM) (56) (56) (56) (56)

## PIN PRICK

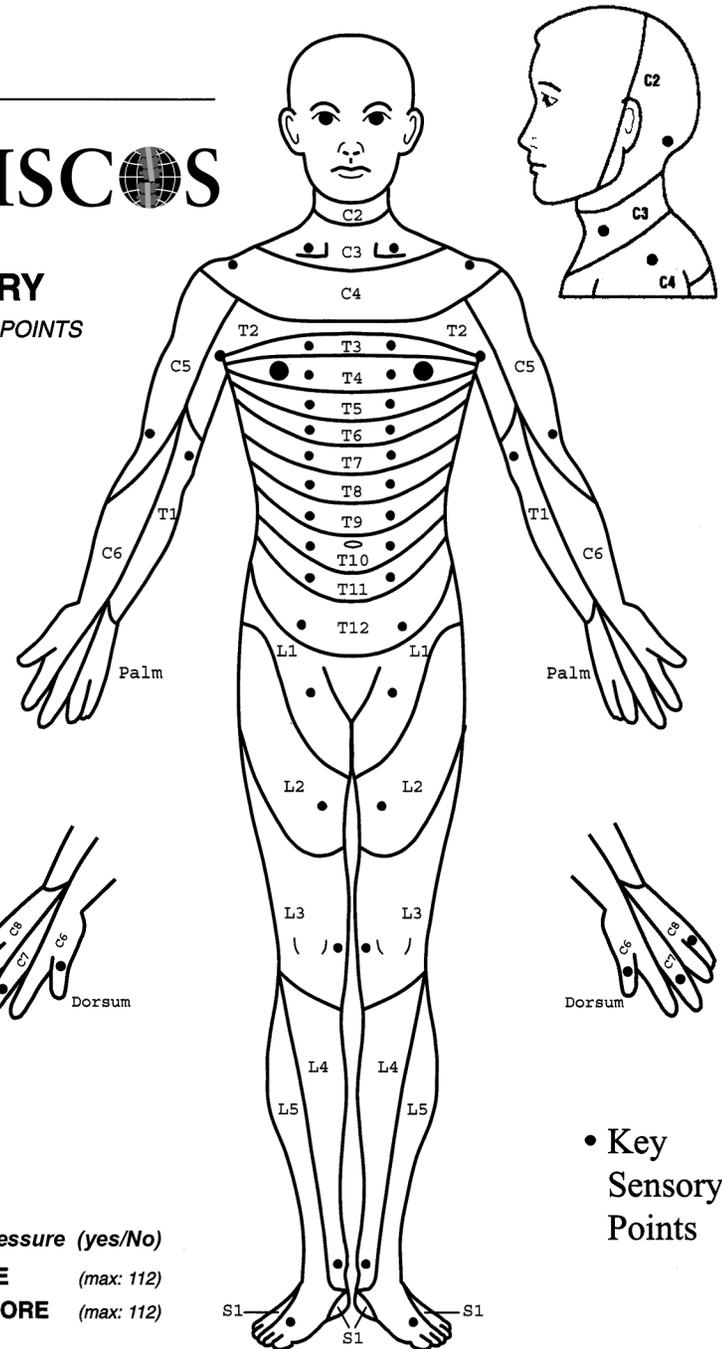
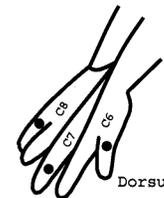
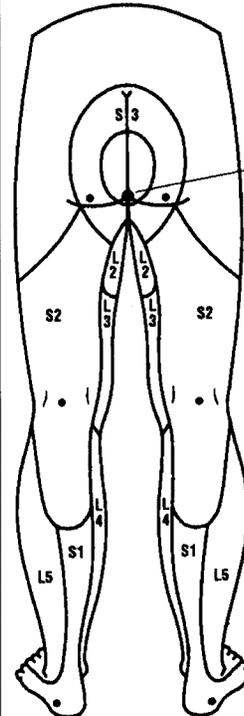
	R	L	R	L
C2				
C3				
C4				
C5				
C6				
C7				
C8				
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				
T10				
T11				
T12				
L1				
L2				
L3				
L4				
L5				
S1				
S2				
S3				
S4-5				

+  =   
(56) (56) (56) (56)

## SENSORY

KEY SENSORY POINTS

0 = absent  
1 = altered  
2 = normal  
NT = not testable



• Key Sensory Points

## NEUROLOGICAL LEVEL

The most caudal segment with normal function

SENSORY  R  L  
MOTOR  R  L

SINGLE NEUROLOGICAL LEVEL

COMPLETE OR INCOMPLETE?   
Incomplete = Any sensory or motor function in S4-S5

ASIA IMPAIRMENT SCALE (AIS)

(In complete injuries only)  
ZONE OF PARTIAL PRESERVATION

Most caudal level with any innervation

SENSORY  R  L  
MOTOR  R  L

## 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 muscle specific 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, disuse) 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 range of motion).

## ASIA Impairment (AIS) Scale

- A = Complete.** No sensory or motor function is preserved in the sacral segments S4-S5.
- B = Sensory Incomplete.** Sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5 (light touch, pin prick at S4-S5: or deep anal pressure (DAP)), 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 more than half of key muscle functions below the single 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  $\geq 3$ .
- 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 Standards at this time allows 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 **single neurological level** is used.

## Steps in Classification

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

- Determine sensory levels for right and left sides.
- Determine motor levels for right and left sides.  
*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.*
- Determine the single neurological level.  
*This is the lowest segment where motor and sensory function is normal on both sides, and is the most cephalad of the sensory and motor levels determined in steps 1 and 2.*
- 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.*

- Determine ASIA Impairment Scale (AIS) Grade:

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

NO



**Is injury motor Incomplete?** If **NO**, AIS=B (Yes=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)

YES



**Are at least half of the key muscles below the single neurological level 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.*