

# ISNCSCI / ASIA

## Examination & Cases

*Getachew A.*

# Objectives

- Be familiar with how the ISNCSCI/ASIA exam is performed
- Be able to define/determine the following:
  - ▶ Sensory level
  - ▶ Motor level
  - ▶ Neurological level of injury
  - ▶ Completeness of injury
  - ▶ AIS Classification
- Be able to determine ASIA impairment scale classification using practice cases

# ISNCSCI / ASIA Examination

- ▶ American Spinal Injury Association (ASIA) had created the International Standards of Neurological Classification of Spinal Cord Injury (ISNCSCI)
- ▶ Standardize the way in which severity is determined and documented.
  - Better communication between and among professionals
  - Provide guidance for establishing prognosis
  - Important tools for clinical research trials

# ASIA Examination

## ► Includes

- Sensory level
- Motor level
- Neurological level of injury (NLI)
- Complete vs. Incomplete injury
- Sacral sparing
- Zone of Partial Preservation (complete injuries)

# Sensory Level

- 28 key dermatomes
- Test light touch and pinprick
- Face is used as control.
- Three point scale:
  - ▶ 0 = absent
  - ▶ 1 = impaired
  - ▶ 2 = normal
  - ▶ NT = not tested

# Light Touch Sensory Scoring

- ▶ Use cotton tip applicator
- ▶ Stroke across skin moving over a distance that does not exceed 1 cm
- ▶ For C6-C8 use dorsal surface of proximal phalanx
- ▶ Chest and abdomen points should be tested in the midclavicular line

# pinprick scoring

- ▶ Clean safety pin
- ▶ Use consistent pressure in each dermatome
- ▶ Poke one time only, not repeated

? You test the C6 dermatome and patient says “It feels sharp, but not as sharp as my face”. What score do you assign that dermatome?

Patient “feeling” PP but unable to differentiate sharp and dull is simply sensing pressure  
PP sensation is ABSENT.

# Sensory Testing—perianal area

- ▶ S4/5 dermatome represents the most caudal aspect of the spinal cord
- ▶ S4/5 is tested for both PP and LT
- ▶ Deep anal pressure: on digital rectal exam patient is asked to report sensory awareness. Recorded as “present” or “absent”.



# Determining sensory level

- ▶ Determined for right side and left side
- ▶ Defined as the level where sensory function is normal on both sides of the body
- ▶ Lowest level where you have “2’s” with all above levels being “2’s”

# Motor Examination

- 10 key muscle groups
- Other muscles may be clinically important but do not contribute to motor scores
- Examine in rostral to caudal sequence (**Don't Skip Around!**)
- Tested in supine position
  - ▶ Necessary during acute period, allows for comparison later on.
- 6 point scale (0-5)
  - ▶ Only whole numbers, no plus/minus (for research purposes)

## Motor Exam

- 1: Muscle twitch
- 2: Full active ROM with gravity eliminated
- 3: Full active ROM against gravity
- 4: Able to generate some resistance
- 5: Normal strength

5/21/201  
9

10

# Motor examination

## Upper Extremities:

- ▶ C5 = Elbow Flexors
- ▶ C6 = Wrist Extensors
- ▶ C7 = Elbow Extensors
- ▶ C8 = Finger Flexors
- ▶ T1 = Finger Abductors

## Lower Extremities

- ▶ L2 = Hip Flexors
- ▶ L3 = Knee Extensors
- ▶ L4 = Ankle Dorsiflexors
- ▶ L5 = Long Toe Extensors
- ▶ S1 = Ankle Plantarflexors

# Motor testing

- Test each of the ten key muscles
- Record numeric values only (for research and test-taking purposes).
- Voluntary anal contraction: contraction of EAS around examiners finger; graded as “present” or “absent”
- If only minimal movement in muscle group palpate over muscle
- Pain and deconditioning may cause patient to grade 4/5; can grade this as 5\*
- Score “NT” if patient not fully testable due to pain, spasticity, uncontrolled clonus, fracture
- Contractures:
  - ▶ What do we do???
- NT if contracture limits > 50% ROM

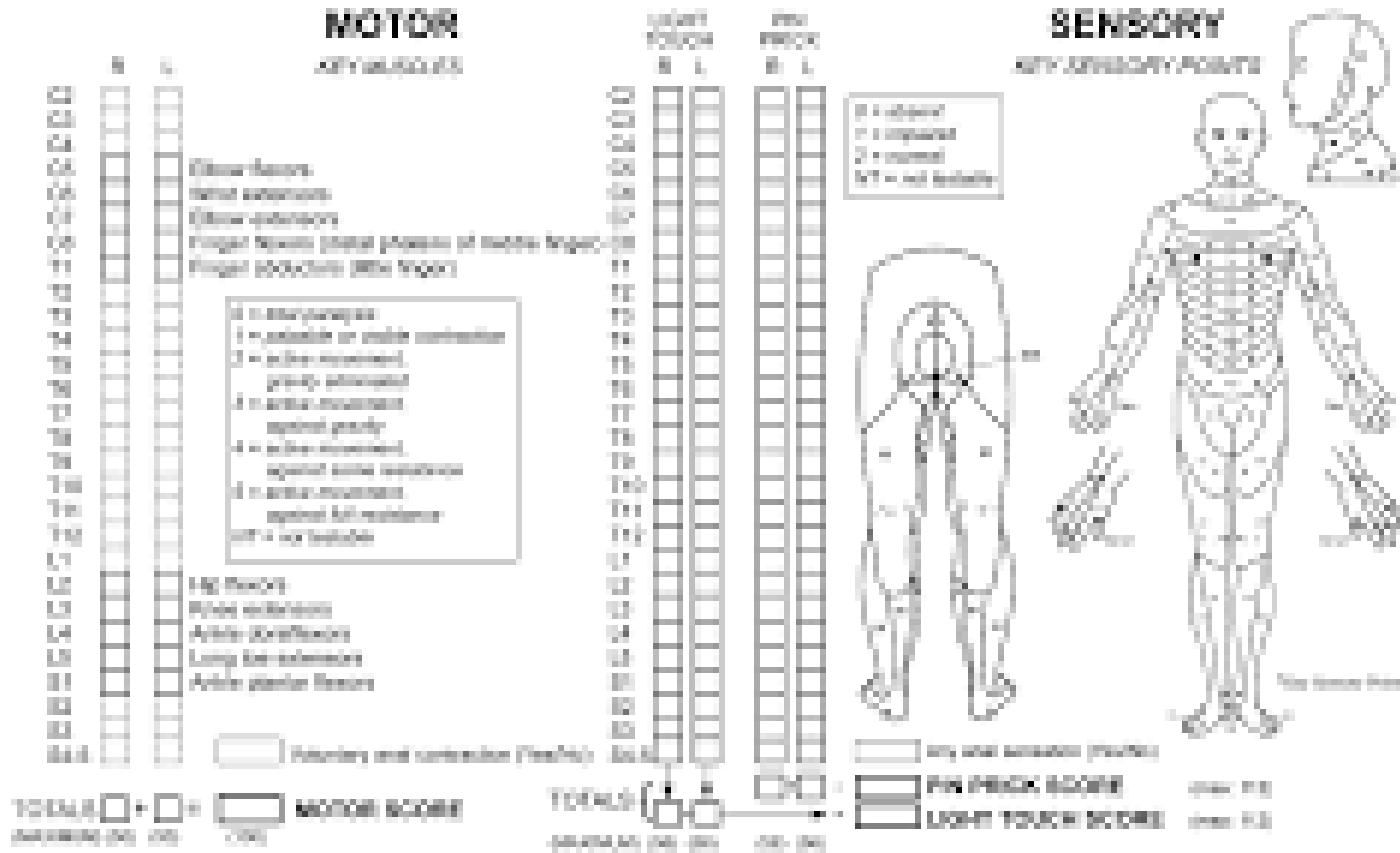
# Motor score

- ▶ Level at which strength is at least 3/5 with all levels above being 5/5
- ▶ Scored for each side, overall score is last normal for both.
- ▶ Sensory level is in a region that cannot be tested (C2-4, T2-L1, S3-5)
- ▶ Motor level is designated as being the same as the sensory level.

If can't test motor, then motor level is same  
as sensory level



# STANDARD NEUROLOGICAL CLASSIFICATION OF SPINAL CORD INJURY



<b>NEUROLOGICAL LEVEL</b> <small>The most caudal segment with normal function</small>	SENSORY: <input type="checkbox"/> B <input type="checkbox"/> L	<b>COMPLETE OR INCOMPLETE?</b> <small>Complete: no sensory or motor function below</small>	<input type="checkbox"/>	<b>ZONE OF PARTIAL PRESERVATION</b> <small>Neurological level(s) immediately caudal</small>	SENSORY: <input type="checkbox"/> B <input type="checkbox"/> L MOTOR: <input type="checkbox"/> B <input type="checkbox"/> L
	<b>KEY IMPAIRMENT SCALE:</b>		<input type="checkbox"/>		

The following form is copyrighted but should not be altered without permission from the American Spinal Cord Injury Association.

# Neurological level of injury (NLI)

- ▶ The most caudal (lowest) level at which both motor and sensory modalities are intact on both sides of the body.
  - Motor  $\geq 3/5$  with levels above being 5/5
  - Sensory intact bilaterally for LT and PP with all sensation above intact
  - If there is no key muscle for a segment that has sensory intact (C2-4, T2-L1, S3-5), the sensory level defines the motor level and the NLI

# Complete vs. incomplete

- ▶ Complete = NO sacral sparing
  - “NOON sign”
- ▶ Incomplete = ANY sacral sparing

## Sacral sparing

- Light touch sensation at S4/5
- Pinprick at S4/5
- Deep anal pressure
- Voluntary anal contraction

## Zone of Partial Preservation

- All segments below NLI with preservation of sensory or motor findings in complete SCI



Thank  
you