

ACADEMY OF SPINAL CORD INJURY PROFESSIONALS



Training session effect on International Standards for Neurological Classification of Spinal Cord Injury classification accuracy

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BACKGROUND

- Successful utilization of the International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) requires a comprehensive understanding of its rules and nuances
- Low accuracy rates in ISNCSCI classification have been reported with common errors identified
- Formal ISNCSCI training has been shown to improve classification accuracy
- The 2019 ISNCSCI updates introduced challenging concepts (i.e. documentation of non-SCI conditions and revised definition of the zone of partial preservation (ZPP))
- No studies have evaluated classification accuracy or the effectiveness of ISNCSCI training since the 2019 changes

STUDY OBJECTIVE

- Assess the effect of an ISNCSCI training session on classification accuracy and identify common errors and classification challenges

DESIGN & METHODS

- Pre-test to post-test comparison study
- Virtual 4-hour pre-conference workshop on ISNCSCI classification was held at the 2021 ASCIP annual meeting
- 13 course attendees completed pre- and post-training assessments consisting of 6 classification cases, each with 11 variables (right/left sensory level, right/left motor level, neurological level of injury (NLI), completeness, ASIA Impairment Scale (AIS) grade, and right/left sensory and motor ZPP)
- Included 2 cases with non-SCI conditions (example seen in Figure 1) to evaluate accurate application of 2019 ISNCSCI updates

RESULTS

- Accurate total mean pre- and post-test accuracy was 69% and 88%, respectively ($p < 0.001$)
- Mean score increases were demonstrated in each ISNCSCI variable category (Figure 2)
- The greatest percentage of pre-test errors was related to ZPP (35% sensory, 26% motor), followed by AIS grade (10%)
- Two cases involved non-SCI conditions and these cases had the lowest pre-test mean scores (61% and 65%)

RIGHT MOTOR KEY MUSCLES

C2	2	2
C3	2	2
C4	2	2
C5	5	2
C6	5	2
C7	5	2
C8	5	2
T1	5	2
T2	2	2
T3	2	2
T4	2	2
T5	2	2
T6	2	2
T7	2	2
T8	2	2
T9	2	2
T10	2	2
T11	2	2
T12	1	1
L1	1	1
L2	0	0
L3	0	0
L4	0	0
L5	0	0
S1	0	0
S2	0	0
S3	0	0
S4-5	0	0

RIGHT SENSORY KEY SENSORY POINTS

Light Touch (LTR)	Pin Prick (PPR)
C2	2
C3	2
C4	2
C5	2
C6	2
C7	2
C8	2
T1	2
T2	2
T3	2
T4	2
T5	2
T6	2
T7	2
T8	2
T9	2
T10	2
T11	2
T12	1
L1	1
L2	0
L3	0
L4	0
L5	0
S1	0
S2	0
S3	0
S4-5	0

LEFT MOTOR KEY MUSCLES

C2	2
C3	2
C4	2
C5	5
C6	NT*
C7	5
C8	NT*
T1	NT*
T2	2
T3	2
T4	2
T5	2
T6	2
T7	2
T8	2
T9	2
T10	2
T11	2
T12	1
L1	1
L2	0
L3	0
L4	0
L5	0
S1	0
S2	0
S3	0
S4-5	0

LEFT SENSORY KEY SENSORY POINTS

Light Touch (LTL)	Pin Prick (PPL)
C2	2
C3	2
C4	2
C5	2
C6	NT*
C7	NT*
C8	NT*
T1	NT*
T2	2
T3	2
T4	2
T5	2
T6	2
T7	2
T8	2
T9	2
T10	2
T11	2
T12	1
L1	1
L2	0
L3	0
L4	0
L5	0
S1	0
S2	0
S3	0
S4-5	0

NEUROLOGICAL LEVELS

1. SENSORY: R T11, L T11*
 2. MOTOR: R T11, L T11*

NEUROLOGICAL LEVEL OF INJURY (NLI): T11*

COMPLETE OR INCOMPLETE?: C (Complete)

ASIA IMPAIRMENT SCALE (AIS): A

ZONE OF PARTIAL PRESERVATION: R L1, L L1

Figure 1: Worksheet for an ISNCSCI case representing a thoracic neurological complete injury (T11* AIS A) in the presence of a left trans-radial amputation. A newer concept tested in this case is the use of the * for documentation of a non-SCI condition. LUE = left upper extremity; AIS = ASIA Impairment Scale; C = complete; NT = not testable

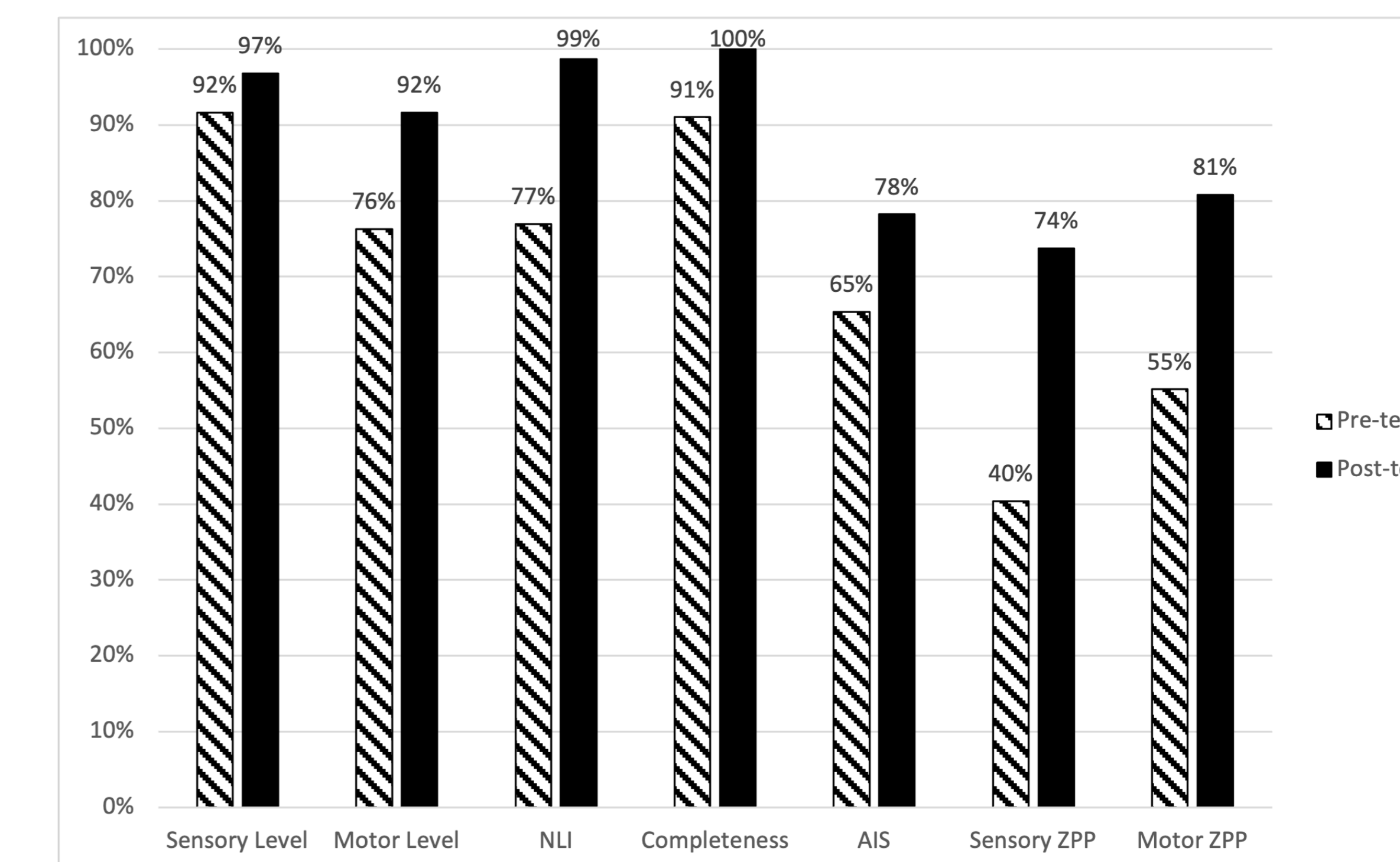


Figure 2: Pre- and post-test percentage of correct answers

CONCLUSIONS

- Accurate ISNCSCI classification is essential for clinical and research applications (i.e. clinical trial eligibility)
- This study highlights classification challenges and demonstrates the utility of educational training sessions to improve ISNCSCI accuracy

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