International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI) ±Use in Acute Care

Kristen Walden, PT

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- Accreditation Canada requires ISNCSCI exam use by acute care hospitals as an SCI standard of care*
- Initial ISNCSCI exam completed on admission supports clinical treatment planning, prognostication, and informed patient education

ACCREDITATION AGRÉMENT CANADA Qmentum STANDARDS

Spinal Cord Injury Acute Services

8.10 Where clinically indicated, a comprehensive and ongoing assessment of patients with spinal cord injury, including the ASIA Impairment Scale (AIS), is completed and documented in partnership with the patient and family.

Guidelines

The International Standards for the Neurological Classification of Spinal Cord Injury (ISNCSCI) are used to conduct the assessment. The results produce overall sensory and motor scores and are used in combination with evaluation of anal contraction as a basis for the determination of ASIA Impairment Scale (AIS) classification. Typically the ASIA Impairment Scale is used for patients with traumatic spinal cord injury; other assessments may be used for non-traumatic patients.

The aim of our project was to determine ISNCSCI implementation (use and accuracy) in Canadian acute care facilities participating in the Rick Hansen Spinal Cord Injury Registry (RHSCIR)** and examine injury and care factors that may impact completion using data collected between Jan 1, 2015 to June 30, 2019 (N=2649)

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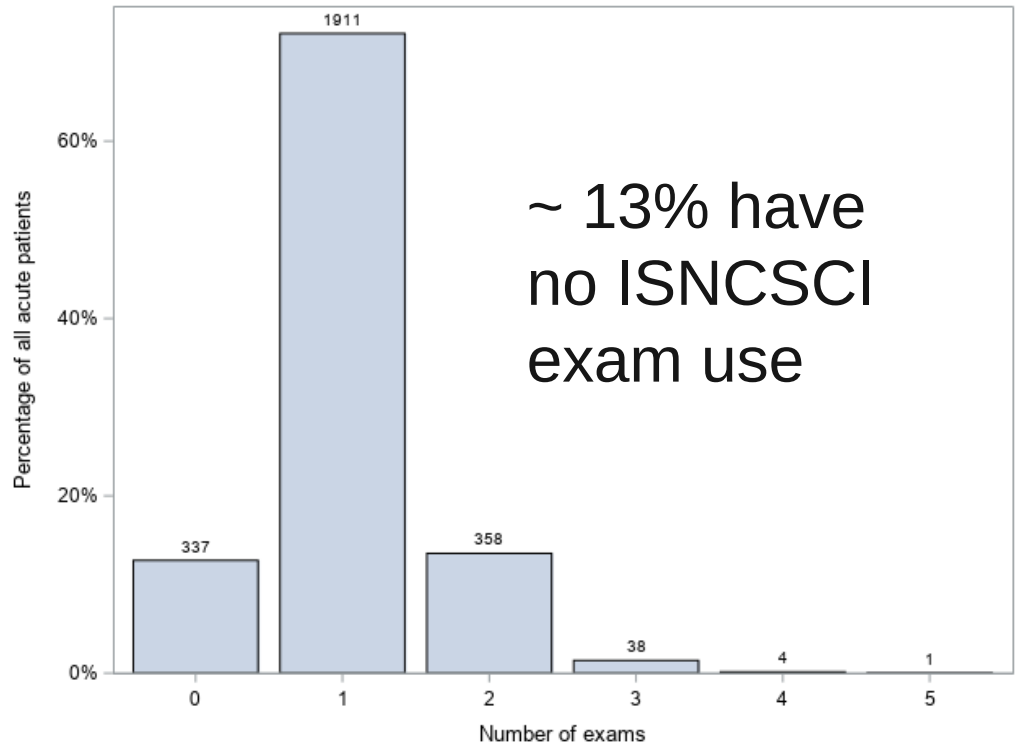
*Ver.14 April 30, 2019
**Note: 1 facility has been excluded from analysis due to data sharing approvals

ISNCSCI Exam Use

ISNCSCI Exam Use = Any motor, sensory, or rectal exam scores documented

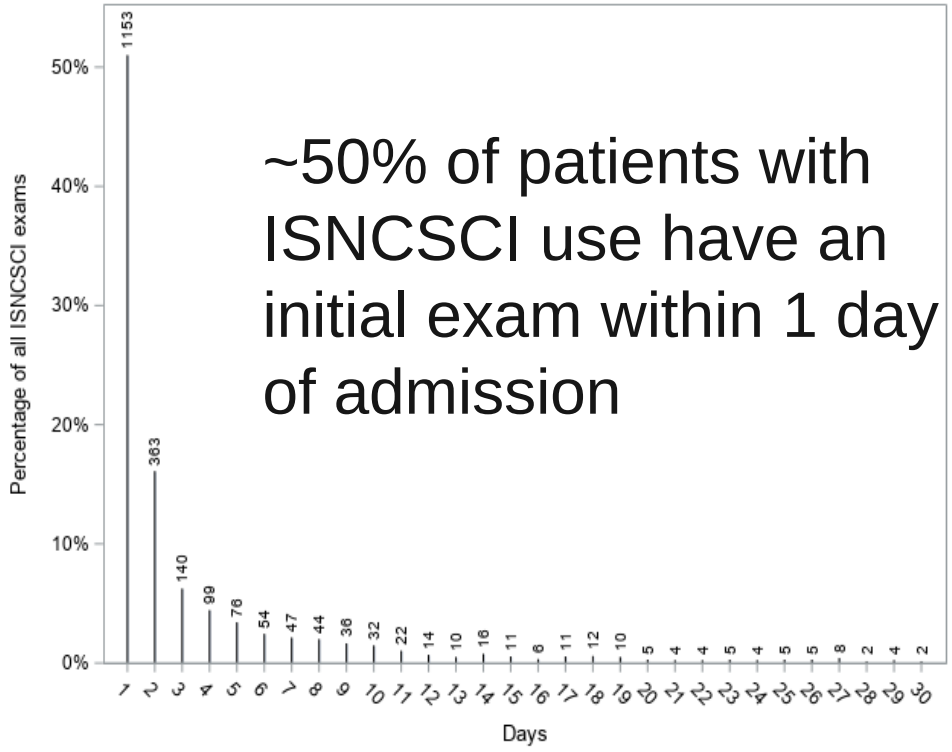
Number of ISNCSCI Exams Per Patient During Acute Care Admission



~ 13% have no ISNCSCI exam use

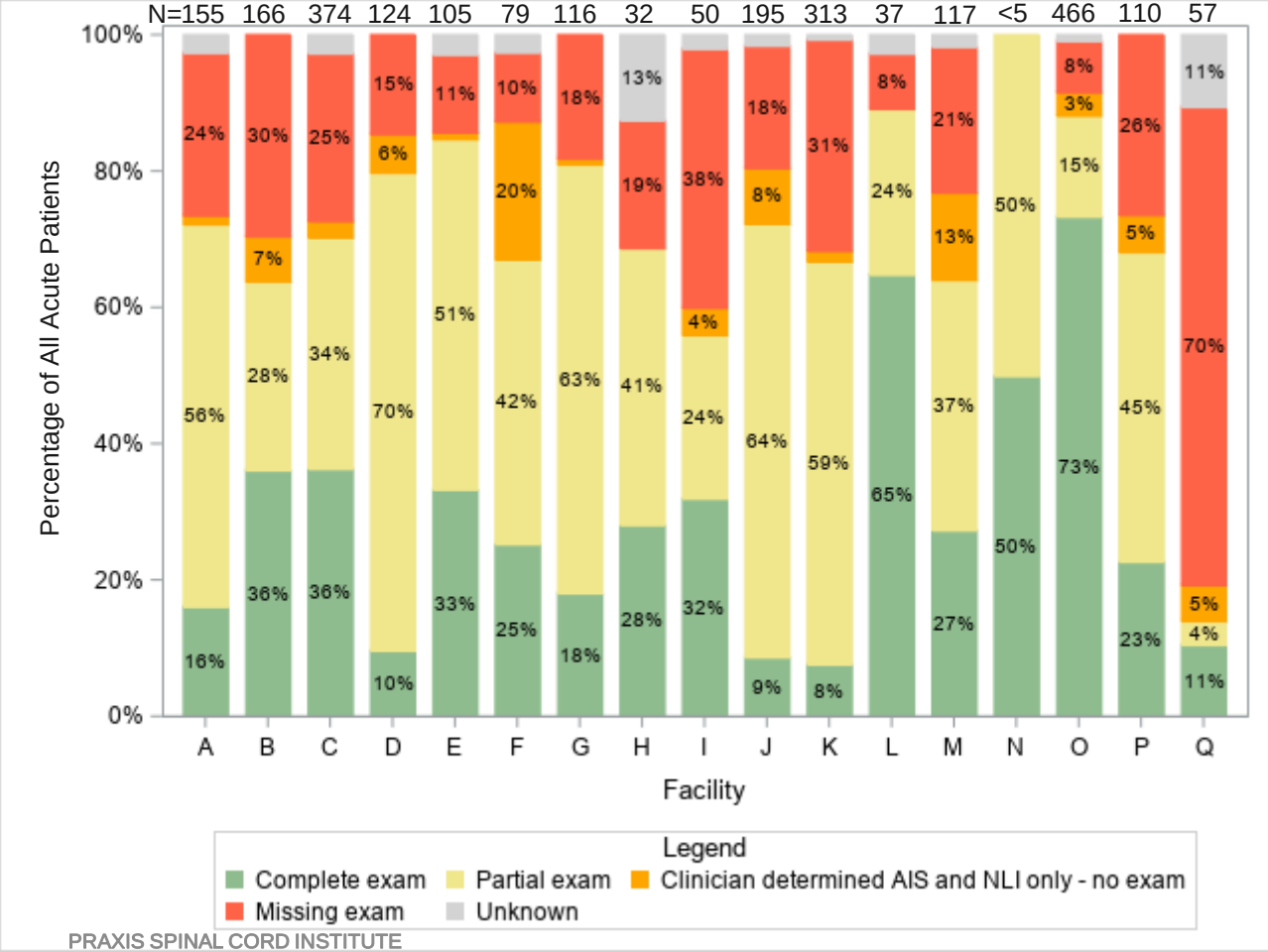
Of those patients with an ISNCSCI exam

Timing of First ISNCSCI Exam



~50% of patients with ISNCSCI use have an initial exam within 1 day of admission

ISNCSCI exam completion within 7 days of acute admission

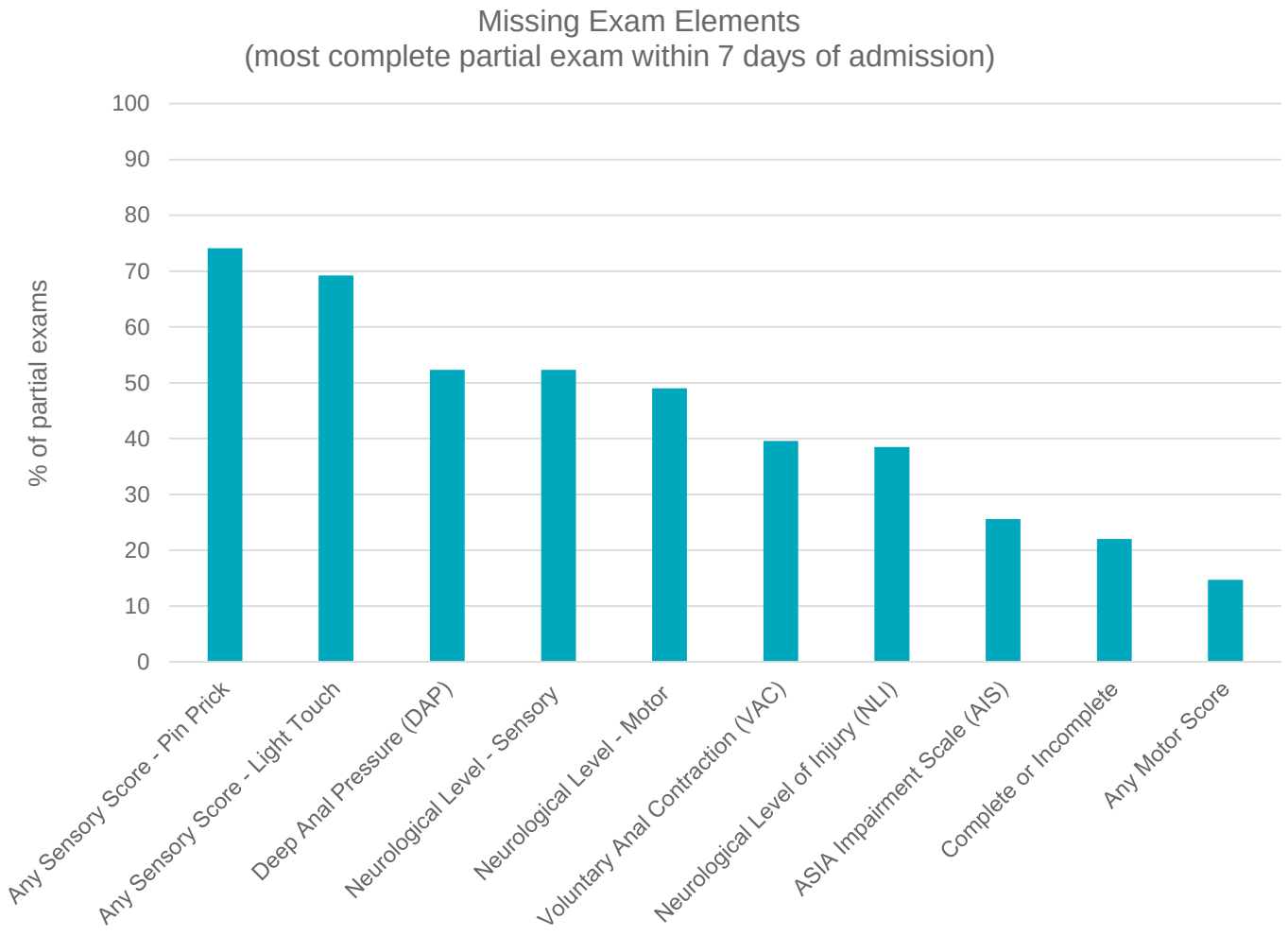


- Completeness varies broadly across facilities
- Only 3 facilities with ≥50% of patients with complete exams

Complete Exam = all motor and sensory scores, Voluntary Anal Contraction score, Deep Anal Pressure score, ASIA Impairment Scale (AIS) & Neurological Level of Injury (NLI) documented.

Notes: Not testable scores counted as valid, documented scores
unknown are exams missing exam date or patient admission date

What is Missing From Incomplete ISNCSCI Exams?



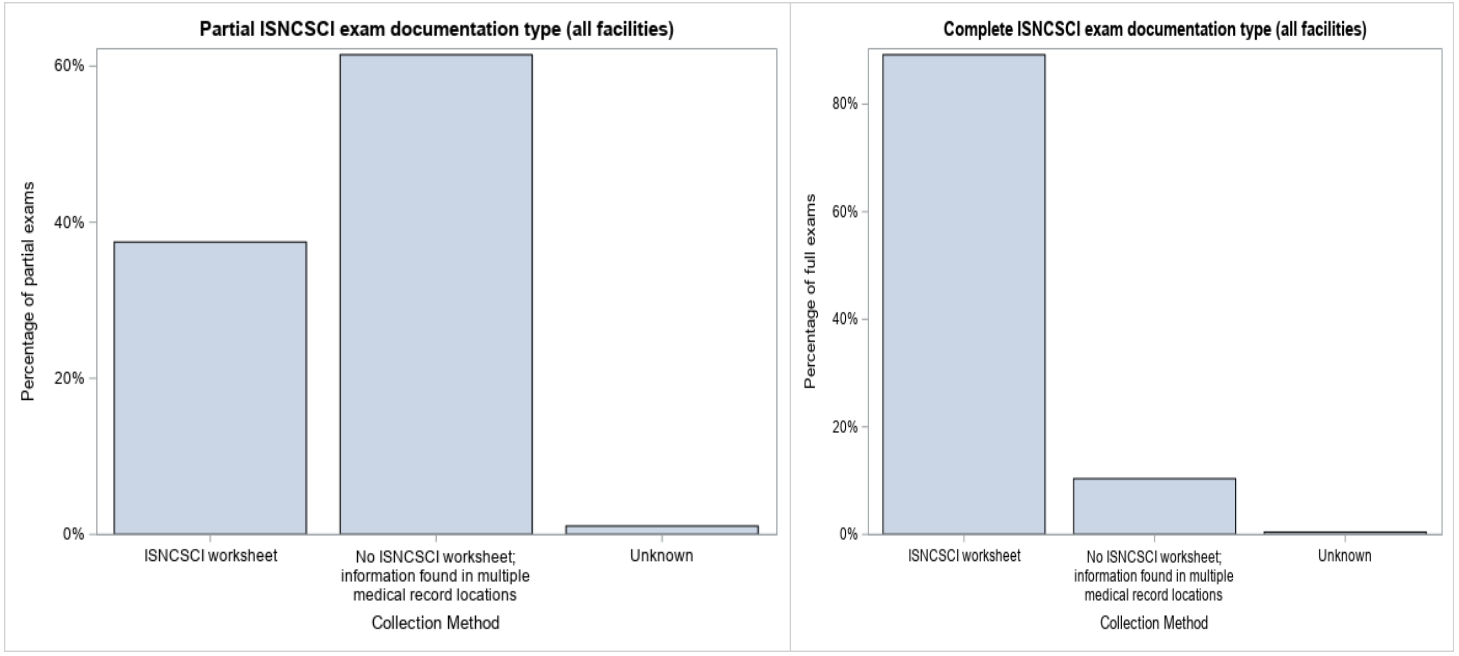
- Pinprick sensation missed most often despite evidence showing it is prognostic of ambulatory function (Oleson et al. 2005)
- Rectal exam components, required for classification of ASIA Impairment Scale, missed in 40-52% of partial exams
- Motor scores are the most frequently completed

Oleson CV, Burns AS, Ditunno JF, Geisler FH, Coleman WP. Prognostic value of pinprick preservation in motor complete, sensory incomplete spinal cord injury. Arch Phys Med Rehabil. 2005 May;86(5):988-92. doi: 10.1016/j.apmr.2004.09.031. PMID: 15895346.

Potential Barriers and Facilitators to ISNCSCI Use

- Initial exploration of potential barriers to ISNCSCI use identified the following factors associated with having no ISNCSCI exam within 7 days of admission:
  - Multi-trauma (ISS>25) (no exam 45% vs full exam 38%, p=0.017)
  - Time to surgery later (no exam median 35h vs full exam median 22 hr, p<0.0001)
  - Admission to ICU (no exam 78% vs full exam 61%, p<0.0001)

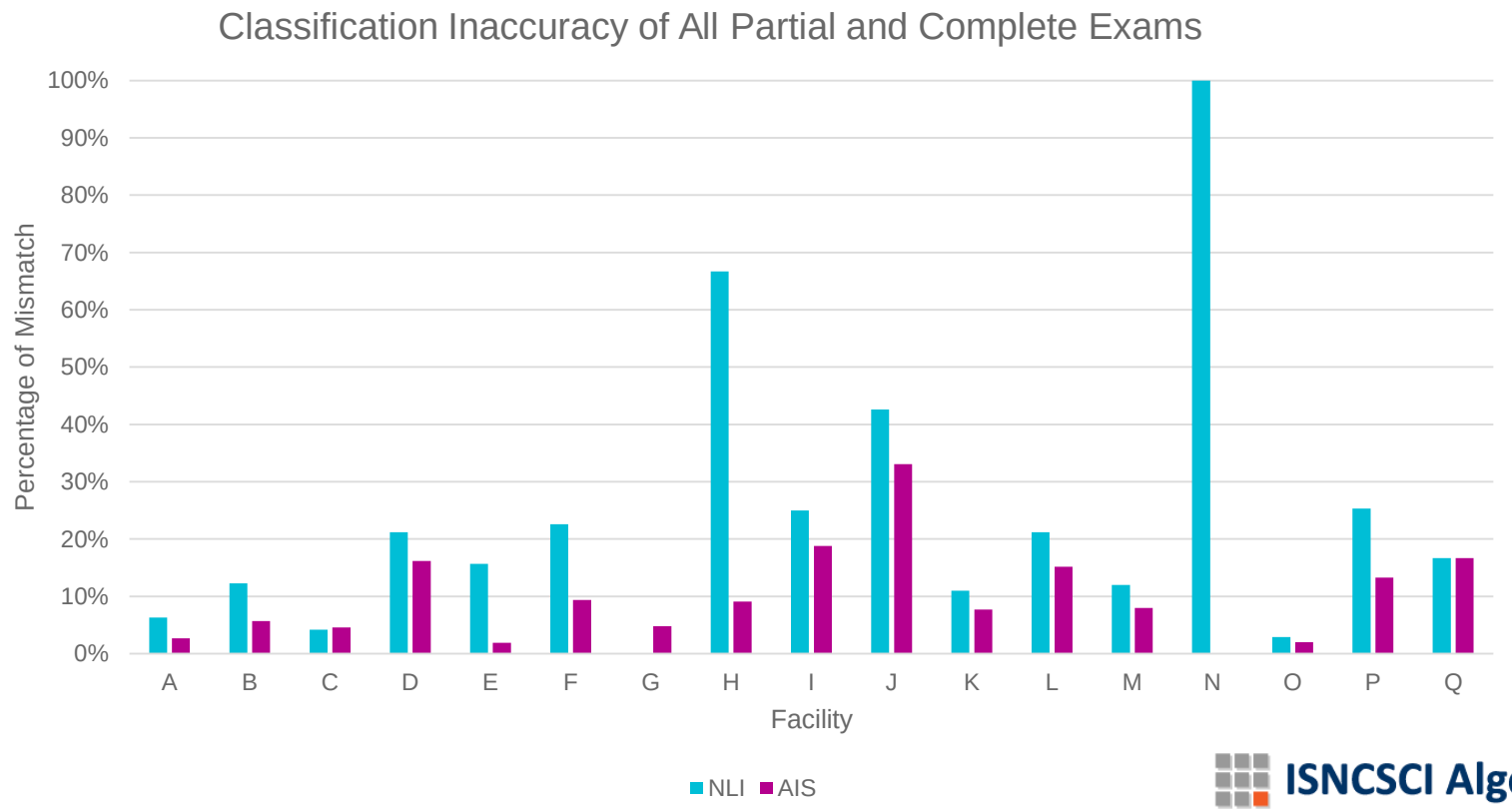
- Potential Facilitators to ISNCSCI Use within 7 days of admission:
  - Admission to Step Down Unit (full exam 77% vs no exam 56%, p <0.0001)
  - ISNCSCI worksheet use



ISNCSCI Classification Accuracy

Accuracy of clinical determination of Neurological Level of Injury(NLI) and ASIA Impairment Scale(AIS) compared to validated computer algorithm (Walden et al. 2015)

Of the most complete single exam within 7 days of admission



- Percentage of patients across all facilities:
  - 17% (257/1496) SNL inaccuracy
  - 10% (157/1496) AIS inaccuracy

ISNCSCI Algorithm

Walden K, Belanger LM, Biering-Sorensen F, Burns SP, Echeverria E, Kirshblum S *et al.* Development and validation of a computerized algorithm for International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI). *Spinal Cord* 2015; **54**: 197–203.

Take Home Messages & Next Steps

- ISNCSCI use and completeness vary widely across acute care RHSCIR facilities
  - Most facilities use the exam but only partially complete it
  - Most frequently missed are sensory exam, rectal exam, and classification of neurological level
  - Need for ISNCSCI implementation into standard practice at all facilities
  - ISNCSCI worksheet use improves exam completion/complete documentation

- Need for further clinical training, and integration into ongoing local training processes at many facilities to improve accuracy
  - NLI inaccurate >AIS

- Next Steps:
  - Further investigation into unknown and other reasons given where ISNCSCI not used
  - More detailed analysis of potential barriers/facilitators
  - Evaluation of ISNCSCI implementation in Canadian rehabilitation facilities

Thank You!

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- Dr. Vanessa Noonan
- Ms. Di Wang
- Ms. Suzanne Humphreys
- Dr. Christiana Cheng
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Questions?

kwalden@praxisinstitute.org