Reviewer ID: Christie Chan, John Zhu, Jeremy Mak, Matthew Quérée, Risa Fox			
Type of Outcome Measure: Spinal Cord Injury-Secondary Conditions Scale (SCI-SCS)			Total articles: 3
Author ID Year	**Study Design**	**Setting**	**Population (sample size, age) and Group**
Conti et al. 2019	Validation cross-sectional study	Multicetnre study in outpatient clinics of three urban spinal units across Italy	N = 156 (126M, 30F) Mean age: 50.17 Tetraplegia: 55 Incomplete Injury (ASIA B,C,D): 97 Non-traumatic injury: 24
Arora et al. 2015	Psychometric study of the telephone and paper based SCI-SCS	Royal North Shore Hospital, Sydney, Australia	N = 40 (32M, 8F) Median age 54, IQR: 48~63 Median years since injury: 28, IQR: 14~35 AIS A/B/C: 27/11/2 Lvls of injury: C2-C4: 4 C5-C8: 22 T1-T6: 6 T7-T12: 8
Kalpakjian et al. 2007	Data used were drawn from a larger holistic study. Data were collected from participants at 5 time points (**Time 1** (t1)= baseline **Time 2** (t2) = directly after a health promotion intervention **Time 3** (t3) = 4-month follow up **Time 4** (t4) = 1-year post-intervention **Time 5** (t5) = 2-year post intervention) during the course of the holistic study; subsequent follow-up was done using written surveys	United States	N = 65 Male = 46 Female = 19 Mean age = 43.8 Mean (SD) years since injury = 13.7 (11.0) Participants at: t1 = 65 t2 = 55 t3 = 45 t4 = 42 t5 = 35 Paraplegic/incomplete = 8 Paraplegic/complete = 26 Tetraplegic/incomplete = 13 Tetraplegic/complete = 15

1. RELIABILITY

Author ID	Internal Consistency	Test-retest, Inter-rater, Intra-rater
Conti et al. 2019	Cronbach's alpha: Genitourinary and bowel = 0.72 Muscle structures and pain = 0.70 Skin, breathing, and metabolism = 0.59 Circulatory and autonomic = 0.62 Italian SCI-SCS total score = 0.73 a-coefficient of total 15 items = 0.73	ICC & Kappa Coefficient Test-retest reliability= 0.91 (C.I. = 0.78 – 0.96) Genitourinary and bowel = 0.90 (C.I. = 0.76 – 0.96) Muscle structures and pain = 0.89 (C.I. = 0.72 – 0.95) Skin, breathing, metabolism = 0.86 (C.I. = 0.65 – 0.95)

		Circulatory and Autonomic = 0.87 (C.I. = 0.70 – 0.95)
Arora et al. 2015		Test-retest btwn two telephone-based assessments: 4-6 day ICC(95%CI) = 0.96(0.93-0.98) % Agreement of two assessments that are within n-points: n=0 (identical score): 28% n=1: 60% n=2: 85% n=3: 93% n=4: 95% n=5: 98% n=6: 100%
Kalpakjian et al. 2007	Cronbach's alpha: t1 = 0.841 t2 = 0.869 t3 = 0.809 t4 = 0.863 t5 = 0.761 Acceptable levels of internal consistency are > 0.70 Item analysis was conducted to ensure that all items had acceptable item total correlations: r ≥0.20	t1-t2: r = 0.698 t1-t3: r = 0.569 t1-t4: r = 0.629 t1–t5: r = 0.663 t2-t3: r = 0.805 t2-t4: r = 0.757 t2-t5: r = 0.716 t3-t4: r = 0.747 t3-t5: r = 0.781 t4-t5: r = 0.694 For all P<.001 Coefficients generally exceeded 0.60, suggesting generally acceptable reliability across time.

2. VALIDITY

Author ID	Validity
Conti et al. 2019	Modified Barthel Index (MBI) p-value = 0.016 Pearson's r = -0.20 SF-8 Physical component (PCS) p-value = <0.001 Pearson's r = -0.36 SF-8 Mental component summary (MCS) p-value = 0.014 Pearson's r = -0.21 Patient Health Questionnaire (PHQ-9) p-value = <0.001 Pearson's r = 0.43

	General anxiety disorder 7 (GAD-7) p-value = <0.001 Pearson's r = 0.30 Tetraplegia p-value = 0.003 Pearson's r = 0.29
Arora et al. 2015	Between telephone-based & paper-based assessment (interval of 3-5 days): ICC(95%CI) = 0.90(0.83-0.95) % Agreement of two assessments that are within n-points: n=0 (identical score): 18% n=1: 60% n=2: 80% n=3: 80% n=4: 88% n=5: 93% n=6: 95%
Kalpakjian et al. 2007	Content analysis was based in the selection of items from the Seekins Secondary Conditions Questionnaire to specifically target secondary conditions associated with SCI that directly and indirectly impact health and physical functioning. Items were selected based on 3 criteria: 1) that they represent conditions that are physiologic in nature; 2) that they are measureable by patient history and physical examination, reported episodes, validated scales, or medical tests or interventions; and 3) those that can be either prevented or managed with medical intervention and/or health behaviours. Spearman's rho between the SCI Secondary Conditions Scale and Short Form-12 (SF-12) subscales - physical functioning, general health, and pain items and a general rating of health: Rating of health=-0.336, P=.008 Health limited moderate activities such as pushing a vacuum cleaner, climbing 1 flight of stairs/ramps=0.359, P=.004 Health limited climbing several flights of stairs/ramps=0.437, P<.001 Accomplished less than would like due to health problems=0.317, P=.012 Limited in the kind of work or other activities due to health problems=0.442, P<.001 Degree pain interfered with normal work (in and out of the home)=0.644, P<.001 How much of the time physical health (and emotional well-being) interfered with social activities=0.475, P<.001 There are significant correlations between the SCI-SCS total score and the 6 SF-12 items. Most associations were moderate and in expected directions.

3. RESPONSIVENESS – no data available

4. FLOOR/CEILING EFFECT

Author ID	Floor/ceiling effect

Conti et al. 2019	Floor and ceiling effects deemed present if 15% or more participants scored the lowest or the highest attinable values on the SCI-SCS
	  - Skin, breathing, and metabolism (27%)
	  - Circulatory and autonomic (25%)

Kalpakjia	There are ceiling effects on 3 categories of secondary conditions (>20% scored in the highest category):

n et al. 2007	- sexual dysfunction (26.2%)
	- chronic pain (32.3%)
	- joint and muscle pain (29.2%)
	There are floor effects on all 16 categories of secondary conditions (>20% scored in the lowest category):
	- pressure sore (76.9%)
	- injury caused by loss of sensation (76.9%)
	- muscle spasms (41.5%)
	- contractures (67.7%)
	- heterotopic bone ossification (89.2%)
	- diabetes mellitus (87.7%)
	- bladder dysfunction (36.9%)
	- bowel dysfunction (40.0%)
	- urinary tract infections (61.5%)
	- sexual dysfunction (43.1%)
	- autonomic dysreflexia (70.8%)
	- postural hypotension (80.0%)
	- circulatory problems (50.8%)
	- respiratory problems (80.0%)
	- chronic pain (33.8%)
	- joint and muscle pain (29.2%)

5. INTERPRETABILITY

Author ID	Interpretability
Kalpakijan et al. 2007	Proportion of sample reporting degree of problems with secondary conditions (time 1, n=65):

Health problem:	% reporting significant or chronic problem (score = 3)	% reporting moderate or occasional problem (score = 2)	% reporting mild or infrequent problem (score = 1)	% reporting not a problem (score = 0)
Pressure sore(s)	3.1	1.5	18.5	76.9
Injury caused by loss of sensation	4.6	4.6	1.8	76.9
Muscle spasms (spasticity)	18.5	10.8	2.72	41.5
Contractures	10.8	9.2	12.3	67.7
Heterotopic bone ossification	0.0	4.6	6.2	89.2
Diabetes mellitus	4.6	4.6	3.1	87.7
Bladder dysfunction	13.8	16.9	32.3	36.9
Bowel dysfunction	13.8	12.3	33.8	40.0
Urinary tract infections	9.2	9.2	18.5	61.5
Sexual dysfunction	26.2	12.3	18.5	43.1
Autonomic dysreflexia	6.2	3.1	20.0	70.8
Postural hypotension	4.6	4.6	10.8	80.0
Circulatory problems	13.8	9.2	26.2	50.8
Respiratory problems	3.1	4.6	10.8	80.0
Chronic pain	32.3	10.8	23.1	33.8
Joint and muscle pain	29.2	24.6	16.9	29.2

Using Time 1 data, on average, the sample reported some degree of problem with an average of 6±3 secondary

conditions.