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ORIGINAL CONTRIBUTION

Preliminary Reliability and Validity of a Spinal Cord Injury Secondary Conditions Scale

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Abstract

Background/Objective: Although the impact of secondary conditions after spinal cord injury (SCI) on health, well being, and financial burden have been studied, there are psychometrically sound scales of secondary conditions in the extant literature. The use of such scales allows for cross-sample comparison of secondary condition prevalence rates and associations with functional, medical, and psychosocial factors. Thus, the purpose of this study was to evaluate the preliminary reliability of a SCI secondary conditions scale.

Methods: The Spinal Cord Injury Secondary Conditions Scale (SCI-SCS) is a 16-item scale based on the Seekins Secondary Conditions Scale. Sixty-five individuals with SCI completed written surveys at 5 time-points over 2 years.

Results: Internal consistency across each of the time-points exceeded 0.76; test–retest reliability ranged from 0.569 to 0.805. Convergent validity was assessed with 6 physical functioning items from the SF-12. Spearman (coefficients were all statistically significant and ranged from 0.317 (accomplished less because of health problems) to 0.644 (pain). The most prevalent secondary conditions were chronic pain, joint and muscle pain, and sexual dysfunction.

Conclusions: Preliminary testing of the SCI-SCS suggests that it is a reliable and valid scale, and further development (ie, factor analysis, item revision) and examination of validity are recommended with larger and more diverse SCI samples.

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Key Words: Spinal cord injuries; Secondary conditions; Respiratory disease; Pain; Spasticity; Urinary tract infections; Pressure ulcers; Autonomic dysreflexia; Psychometrics; Validity; Reliability; Scales

INTRODUCTION

Secondary conditions after spinal cord injury (SCI) have the potential to dramatically impact, not only health, but emotional well being, community participation, and quality of life (1–5). Although life expectancies have risen in recent decades, people with SCI still die at younger ages than the general population because of medical complications and secondary conditions (6). A variety of factors impacting the development of secondary conditions ranging from injury-related characteristics such as level/completeness of and time since injury (7–10) and functional capacity (7,11), to personal characteristics, such as age (8), risk-taking behavior, and substance abuse (12), to larger forces such as sociopolitical, cultural, and health care systems (4,9,13).

Some of the most common secondary conditions include pressure ulcers (7,10,11,14) respiratory problems (eg, pneumonia) (11,15), genitourinary problems (eg, urinary tract infections [UTIs]) (10,16), spasticity (9,10,17,18), pain (17,19,20), and autonomic dysreflexia (10,17) Respiratory complications (9,11,21) and diseases of the genitourinary and skin systems (7,8,11) are among

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the most frequent reasons for rehospitalization. Rates of rehospitalization caused by secondary conditions can outpace the general population by as much as 2.6 times, which was recently reported in a case-controlled study conducted in Canada (21). Also, secondary conditions do not exist in isolation but have the potential to exacerbate each other, creating a synergistic effect that can lead to serious health complications, and in some cases, death.

In an analysis of cause of death among 29,239 cases in the National SCI Statistical Center database and Shriner's Hospitals' SCI units in the United States, respiratory and heart-related causes accounted for more than one half of the deaths (28% and 23%, respectively) (22). Soden et al (23) examined causes of death in an Australian sample of 195 individuals with SCI who had died up to 19 years after injury. Death from septicemia, pneumonia, disease of urinary system, and suicide were significantly higher than in the general population and were among the leading causes of death after SCI.

In addition to the health burdens, the financial burden of treating secondary conditions after SCI can be substantial. In a prospective study of the financial cost of traumatic SCI, Johnson et al. (24) estimated that 32% of medical costs in the first 2 years after injury were directly attributable to secondary medical complications. Complications in neurologic, skin, respiratory, and orthopedic body systems were the most expensive to treat. In particular, pressure ulcers, although not as frequent a cause of hospitalization as respiratory complications in some studies, lead to substantially longer length of stays, resulting in higher treatment costs (7,8). Loss of employment also adds to the financial burden caused by secondary conditions (11).

Although the impact of secondary conditions on these various life domains have been well studied, there are no psychometrically sound scales designed to measure their overall impact on the health of individuals with SCI. Instruments of this sort are not meant to replace clinical examination but have value in research as a summary index facilitating cross-sample comparisons of the influence of secondary conditions as a whole, as well as the testing of the association of secondary conditions to other functional, medical and psychosocial factors. Thus, the purpose of this study was to evaluate the preliminary reliability and validity of an adapted version of the Seekins Secondary Conditions Questionnaire (SCQ) (25), the Spinal Cord Injury Secondary Conditions Scale (SCI-SCS).

METHODS

Sample and Data Collection

The data used to test the SCI-SCS were drawn from a larger study to evaluate the effectiveness of a holistic health promotion program after SCI and are described elsewhere (26). Inclusion criteria for the holistic study included having a C5 level of injury and below, being 18 to 80 years of age, and being at least 1 year after injury. Completeness and level of injury are based on the International Standards for Neurological Classification of Spinal Cord Injury, developed by the American Spinal Injury Association (ASIA) and International Medical Society of Paraplegia (27). Exclusion criteria included the presence of associated cognitive deficits preventing learning and carryover (ie, traumatic brain injury, dementia), medical problems that could impose a health risk (eg, recent myocardial infarction), and a primary disability that was not caused by SCI.

Data were collected from study participants at 5 time-points during the course of the holistic study, and subsequent follow-up using written surveys was made up of standardized scales and individual items. Time 1 refers to baseline, Time 2 refers to directly after a health promotion intervention, Time 3 refers to a 4-month follow-up, Time 4 refers to the 1-year post-intervention follow-up, and Time 5 refers to a 2-year post-intervention follow-up. The study sample included 65 participants at Time 1 and decreased to 55, 45, 42, and 35 participants, respectively, at Times 2 to 5.

Scale Modification

Description of Original Scale and Rationale for Modification. The SCQ (25) was originally developed to assess secondary conditions associated with chronic disability and their impact on multiple life domains. It is one of the few scales to comprehensively assess the range of possible health problems associated with disability; the SCQ also includes psychological problems, accessibility and mobility problems, and other problems such as medication side effects, alcohol and drug abuse, and social isolation resulting from disability. The SCQ contains 40 items that are rated for the degree to which they limited activity or independence in the prior 3 months. The SCQ has been used in the context of SCI by Krause to examine prevalence of secondary conditions in association with aging (26).

Although the SCQ is quite comprehensive in its approach to the impact of secondary conditions on many facets of life, this broadness limits its usefulness for studies targeting specific conditions or an aggregate of overall severity (through self-report). Second, there is no established scoring scheme or algorithm for the SCQ, which limits its useful in research, specifically in regard to cross-sample comparison.

Item Selection. Items for the SCI-SCS were selected from the SCQ to specifically target secondary conditions associated with SCI that directly and indirectly impact health and physical functioning. Items were selected based on 3 criteria: (a) that they represent conditions that are physiologic in nature (vs psychological or environmental); (b) that they are measurable by patient history and physical examination, reported episodes, validated scales, or medical tests or interventions; and (c) those that can be either prevented or managed with medical intervention and/or health behaviors. Using this

criteria, 16 items were selected from the original 40 items, representing problems in the areas of skin, musculoskeletal, pain, bowel/bladder, and cardiovascular; these are briefly described below.

Pressure ulcers are a very serious, costly, and ever present complication after SCI and have a significant impact on morbidity and mortality (28). Pressure ulcers come at significant expense and can take months to years to heal, requiring multiple surgeries and wound care. A number of secondary conditions, including autonomic dysreflexia, increased spasticity, osteomyelitis, and infection are also related to pressure ulcers, broadening its detrimental effects.

Bladder dysfunction after SCI can affect individuals in numerous ways including urinary incontinence, detrusor sphincter dyssynergia, and bladder and kidney stones. Both symptomatic and asymptomatic infections, often requiring hospitalization, are also very prevalent after SCI (29). Such complications, including upper tract dysfunction, may lead to the most serious and potentially fatal condition of kidney failure (30).

Autonomic dysreflexia is defined as an unopposed sympathetic nervous system discharge caused by a noxious or intense stimulus below the level of injury (31). This is primarily seen in injuries at T6 and above, and prolonged and elevated blood pressure can lead to a hypertensive crisis, possibly causing stroke, myocardial infarction, retinal hemorrhages, and even death.

Paralysis, a hypercoagulable state, and injury to blood vessel lining all can contribute to the development of a deep vein thrombosis (DVT) after SCI. The most serious complication of DVT is pulmonary embolism, causing severe cardiopulmonary compromise or even death. Other complications from DVT included leg edema and pain.

The precise mechanisms and etiologies of pain in SCI are not well understood. Chronic pain can be nociceptive in nature and related to an injury (eg, multiple fractures, surgical sites) or neuropathic. Neuropathic or "central pain," although largely misunderstood, is believed to be primarily related to injuries to the spinal cord or peripheral nerves (32). Interference by pain can range from none in everyday activities to totally disabling and can have a dramatic impact physically and emotionally.

Long-term wheelchair and other assistive device users often face overuse injuries to the shoulders and other upper extremity joints (33), with resulting arthritis, bursitis, tendonitis, and common nerve entrapments (eg, ulnar neuropathy, carpal tunnel syndrome) that can further restrict mobility.

Pulmonary complications, especially in those with tetraplegia, arise primarily from the inability to produce an effective cough to clear secretions, generate deep breaths to keep peripheral airways open, and hypoventilation (34). Diminished pulmonary reserve can make respiratory infections such as pneumonia much more serious in individuals with SCI.

Growing evidence is supporting the higher incidence of diabetes and glucose intolerance in individuals with SCI compared with the general population (35). Disuse of large muscle groups in the legs is a factor in altered glucose metabolism. Long-term effects of diabetes, especially when untreated, can significantly impair resistance to infection, retard healing of pressure ulcers and other wounds, and increase the risk of coronary artery and peripheral vascular disease.

Spasticity is a condition of velocity-dependent increase in tonic muscle stretch reflexes and is quite prevalent in SCI. This can hinder proper positioning in a wheelchair and cause pain and difficulty with performing regular hygiene. Some may actually use spasticity for functional activities such as transfers or standing, whereas others may have severe limitations from increased muscle tone (36).

Bowel dysfunction after SCI has been found by many to be a major problem. Fear of bowel accidents can lead to limited community participation. Constipation and bowel impaction can also be a cause of autonomic dysreflexia.

The introduction of catheters, especially indwelling Foley or suprapubic catheters, can introduce bacteria resulting in infection. In fact, over time, most individuals with SCI will develop colonization of the urinary tract with bacteria. Urinary incontinence and increased spasticity may also occur with UTIs. A more serious infection may also occur, resulting in fever, chills, rigors, and systemic infections (38).

Postural hypotension, sometimes referred to as "orthostasis," is caused by a relative loss of sympathetic tone after SCI. Effects of this hypotension may range from no clinical affect to significant lightheadedness and syncope.

Impaired or absent sensation below the level of the injury make individuals with SCI much more susceptible to injuries of the skin and extremities. After injury, loss of bone mass below the level of the injury also increases the risk of fractures (39). An inconspicuous leg injury may lead to fractures, some of which may go undetected. These injuries can range from being minor to very serious complications.

Over time, joints that do not go through a regular range of motion may tighten up, and as connective tissues around a joint become more firm, contractures will develop. These contractures may not always significantly impact the individual's functional level, but have the potential to restrict mobility.

Abnormal bone formation around joints below the level of the injury are most common in the hips, knees, elbows, and shoulders, although the precise mechanism of why this occurs is not well understood (40). If the heterotopic ossification is severe, range of motion and positioning may be impaired, with an increased risk of pressure ulcers in the region of heterotopic ossification.

Sexual function after SCI differs greatly between men and women with SCI. Men will almost always have erectile and ejaculatory dysfunction. In women, the regular menstruation cycle is usually absent temporarily, but will return in 90% of individuals within 6 to 12 months. In women, sexual dysfunction may include dryness of the vagina during intercourse.

Scoring. The rating scale uses a 4-point ordinal scale ranging from 0 (not experienced/insignificant problem never limiting activity) to 3 (significant/chronic problem). Total scores range from 0 to 48 and are derived from the sum of the problem ratings such that higher scores indicate greater overall problems with secondary conditions. The SCI-SCS is given in Appendix A.

Convergent Validity

The SF-12 is an abbreviated version of the widely used SF-36 (41), a widely used measure of health-related quality of life. The SF-12 has been used in several studies with SCI populations (42–45), and version 1 of the SF-12 was also used by the Model SCI Systems from 1995 to 2000. Twelve items reflect physical and psychological functioning and pain and the degree to which these limited activity in the previous 4 weeks, as well as items related to psychological well being. In the holistic study from which these data were drawn, physical functioning items that referred to "climbing stairs" were modified to read "stairs/ramps." Six items related to physical functioning, general health, and pain were used to test convergent validity. Items were used rather than the total Physical Functioning score because, in computing that score, mental health functioning items are included, and these were not of interest in this study. Additionally, because this is the first exploration of this scale, we wanted to more closely examine how well it converged with specific physical functioning domains.

Two items refer to the ability to carry out moderate activities such as pushing a vacuum cleaner or climbing a short ramp and more intensive activities such as climbing several ramps. These are rated on a scale of 1 (not limited at all) to 3 (limited a lot). Two items refer to the degree that physical health had interfered with the ability to carry out work or regular daily activities. These are rated on a scale of 1 (all of the time) to 5 (none of the time). One item refers to the degree that pain interfered with normal home and vocational activities. Finally, a single item assessed self-rating of health in general rated on a scale of 1 (poor) to 4 (excellent).

Statistical Procedures

Before analyses were performed, data were checked for skewness; the total SCI-SCS score was not significantly skewed. Participants' responses at Time 1, for which there were complete data and the largest sample size. The analyses used were aimed at developing a brief measure of secondary conditions that possesses acceptable psychometric characteristics. To that end, we examined 2 aspects of reliability: (a) internal consistency (Cronbach α) and (b) test–retest reliability. Acceptable levels of internal consistency are 0.70 (46) or greater and insure that measurement error is minimized. Furthermore, we conducted item analyses to insure that all items had acceptable item total correlations ($r \geq 0.20$). Acceptable levels of test–retest reliability vary depending on the construct and the time intervals involved. Although few guidelines exist for interpreting test–retest coefficients, typically those evaluated for time periods closer together will be higher than for those evaluated for time periods further apart. Given that our data collection time periods span just a few months to 2 years, it is likely that there will be some variability in the test–retest coefficients. Nevertheless, we expect a fair degree of stability over time ($r \geq 0.50$), because most of the conditions of interest are typically chronic in nature.

Table 1. Demographic Characteristics of the Sample (N = 65)

	Percent
Current age (years) (mean, SD)	43.8 (13.4)
Years since injury (mean, SD)	13.7 (11.0)
Sex: male	70.8
Marital status	
Single (never married)	36.9
Married	47.7
Divorced	15.4
Ethnicity	
White	89.1
African American	9.4
Hispanic	1.6
Education	
Some high school	6.2
High school degree	21.9
Some college	39.1
College degree	20.3
Professional or post-graduate degree	12.5
Work status	
Employed, full-time	24.6
Employed, part-time	6.2
Unemployed	23.1
Retired	23.1
Homemaker	10.8
Student	9.2
Volunteer/other	3.0
Level/completeness of injury	
Paraplegia/incomplete	11.8
Paraplegia/complete	39.7
Tetraplegia/incomplete	20.6
Tetraplegia/complete	23.5

Table 2. Internal Consistency and Test–Retest Coefficients of SCI-SCS total score (T1–T5)

	Internal Consistency (α)	Test–Retest Reliability*	Time 2	Time 3	Time 4	Time 5
Time 1	0.841	*r*	0.698	0.569	0.629	0.663
		Significance	<0.001	<0.001	<0.001	<0.001
		N	49	43	38	29
Time 2	0.869	*r*		0.805	0.757	0.716
		Significance		<0.001	<0.001	<0.001
		N		42	36	28
Time 3	0.809	*r*			0.747	0.781
		Significance			<0.001	<0.001
		N			34	28
Time 4	0.863	*r*				0.694
		Significance				<0.001
		N				30
Time 5	0.761	*r*				
		Significance				
		N				

*N cases vary by time because of attrition and missing responses.

We also evaluated 2 types of validity: content and construct. Our content validity analysis was based in the selection of items from the larger pool of items representing secondary conditions. These procedures are detailed above, and the rationale for inclusion of each item is detailed in the measures section. Our intent was to create a content-valid measure that assessed a subset of common and important secondary conditions that directly and indirectly impact health and well being. Our construct validity analyses are made up of Spearman ρ correlations between our measure of secondary conditions and physical functioning, general health rating, and pain SF-12 items. We expected the secondary conditions scale, given its strong emphasis on physical conditions, to show convergent validity with these items.

RESULTS

Demographic and Injury Characteristics

The sample was predominantly male, white, and generally well educated with a mean age of 43.8 ± 13.4 (SD) years. Slightly less than one half were married, and a third were employed either full- or part-time. Participants were 13.7 ± 11.0 years postinjury on average and nearly evenly divided between paraplegic and tetraplegic injuries; approximately two thirds had complete injuries. Complete demographic and injury characteristics of the sample are provided in Table 1.

Internal Consistency and Test–Retest Reliability

Internal consistency coefficients and test–retest reliability coefficients of the SCI-SCS at each time-point are given in Table 2. Internal consistency exceeded 0.80 with the exception of Time 5, which was still above the acceptable threshold at 0.761. Results of item analyses (Time 1) revealed that item total correlations ranged between 0.26 and 0.65. As a result, all items were retained to compute the total SCI-SCS score. Test–retest reliability coefficients generally exceeded 0.60, suggesting generally acceptable reliability across time.

Prevalence of and Degree of Problem with Secondary Conditions in the Sample

Using Time 1 data, on average, the sample reported some degree of problem with an average of 6 ± 3 secondary conditions. As shown in Table 3, chronic pain, joint and muscle pain, and sexual functioning were most often reported as being most significant or chronic problems. There was no statistically significant difference between injury level/completeness on the SCI-SCS total score ($F_{3,58} = 2.57$, $P = 0.063$).

Convergent Validity

As shown in Table 4, there were significant correlations between the SCI-SCS total score and the 6 SF-12 items described above. Most associations were moderate, ranging from 0.317 to 0.644 and in expected directions.

DISCUSSION

The findings of this first examination of the SCI-SCS suggest that it is a reliable measure, being both internally consistent and having good test–retest reliability. In addition, examination of convergent validity with respect to physical functioning suggested preliminary support for its validity. The association of the SCI-SCS total score association with aspects of physical function were significant and in expected directions. Its strongest association was with pain, which was expected, given chronic pain and joint and muscle pain were most often

Table 3. Proportion of Sample Reporting Degree of Problems with Secondary Conditions (Time 1, N = 65)

Secondary Condition	Percent Significant or Chronic Problem*	Percent Moderate or Occasional Problem	Percent Mild or Infrequent Problem	Percent Not a Problem
Chronic pain	32.3	10.8	23.1	33.8
Joint and muscle pain	29.2	24.6	16.9	29.2
Sexual dysfunction	26.2	12.3	18.5	43.1
Spasticity	18.5	10.8	2.72	41.5
Circulatory problems	13.8	9.2	26.2	50.8
Bladder dysfunction	13.8	16.9	32.3	36.9
Bowel dysfunction	13.8	12.3	33.8	40.0
Contractures	10.8	9.2	12.3	67.7
Urinary tract infections	9.2	9.2	18.5	61.5
Autonomic dysreflexia	6.2	3.1	20.0	70.8
Diabetes	4.6	4.6	3.1	87.7
Postural hypotension	4.6	4.6	10.8	80.0
Injury caused by loss of sensation	4.6	4.6	1.8	76.9
Respiratory problems	3.1	4.6	10.8	80.0
Pressure sores	3.1	1.5	18.5	76.9
Heterotopic ossification	0.0	4.6	6.2	89.2

*Ranked by most to least percent reporting significant or chronic problem.

reported as problematic for the sample, and is consistent with the literature that pain is a significant and pervasive secondary condition in SCI (43,47,48).

Future Directions for Scale Development

The psychometric properties of this scale suggest promise for its further development using larger and more diverse SCI samples. Future development of this scale is warranted in terms of its items, their description, and response scales. Examining the SCI-SCS's factor structure in a larger sample is an important step in scale development. Rephrasing of item descriptions may also be considered for particular items, such as sexual dysfunction, which reflects satisfaction rather than dysfunction. Because retrospective data were used in this study, items could not be reworded before data collection took place but should be considered in future iterations of the scale to clarify some items. Finally, further examination of the scale's construct validity using, for example, correspondence between clinical examination and response to the scale items would be worthwhile to pursue in future studies. More broadly, the use of such a standardized scale in general and an aggregate score in particular should be weighed by SCI investigators in future studies.

Limitations

One of the major limitations of using archival data is lack of control over variables selected for measurement or the

Table 4. Spearman Correlation Coefficients–SCI-SCS Total Score and Physical Function Items

Item	Spearman ρ	Significance
Rating of health	−0.336	0.008
Health limited moderate activities such as pushing a vacuum cleaner, climbing 1 flight stairs/ramp	0.359	0.004
Health limited climbing several flights of stairs/ramps	0.437	<0.001
Accomplished less than would like due to health problems	0.317	0.012
Limited in the kind of work or other activities due to health problems	0.442	<0.001
Degree pain interfered with normal work (in and out of the home)	0.644	<0.001
How much of the time physical health (and emotional well being) interfered with social activities	0.475	<0.001

ability to modifying items or rating schemes before administration. Furthermore, the context of the data used in this analysis also is a potential source of bias such that individuals with interest in wellness and improving their health behavior participated in the health promotion program. Accordingly, they may not be representative of the larger SCI population in terms of their overall health status, prevalence, and impact of secondary conditions. Some findings may also reflect the characteristics of the sample rather than the sensitivity of the scale. For example, there was no difference in scores by level/completeness of injury; a more diverse sample may highlight the ability (or lack of ability) of the scale to distinguish by injury level or other injury or health characteristics.

CONCLUSIONS

The SCI-SCS is not designed to objectively evaluate secondary conditions in SCI, but rather the subjective experience of these problems for use in research to allow for cross-sample comparison and examination of the association of secondary conditions and various aspects of health and psychosocial well being in people with SCI. Preliminary assessment of the reliability and validity of the SCI-SCS suggests a promising scale for use with larger and diverse SCI samples.

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Appendix A. The Spinal Cord Injury Secondary Conditions Scale

Health Problem	Description	Rating
Pressure sore(s)	These develop as a skin rash or redness and progress to an infected sore. Also called skin ulcers, bedsores, and decubitus ulcers.	0 1 2 3
Injury caused by loss of sensation	Injury may occur because of a lack of sensation, such as burns from carrying hot liquids in the lap or sitting too close to a heater or fire.	0 1 2 3
Muscle spasms (spasticity)	Spasticity refers to uncontrolled, jerky muscle movements, such as uncontrolled muscle twitch or spasm. Often spasticity increases with infection or some kind of restriction, like a tight shoe or belt.	0 1 2 3
Contractures	A contracture is a limitation in range of motion caused by a shortening of the soft tissue around a joint, such as an elbow or hip. This occurs when a joint cannot move frequently enough through its range of motion. Pain often accompanies this problem.	0 1 2 3
Heterotopic bone ossification	This is an overgrowth of bone, often occurring after a fracture. Early signs include a loss of range of motion, local swelling and warmth at the area to the touch. This condition must be diagnosed by a physician.	0 1 2 3

Appendix A. Continued

Health Problem	Description	Rating
Diabetes mellitus	Diabetes is a problem resulting from irregularities in blood sugar levels. Symptoms include frequent urination and excessive thirst. This condition is diagnosed by a physician.	0 1 2 3
Bladder dysfunction	Incontinence, bladder or kidney stones, kidney problems, urine leakage and urine back up are all symptoms of bladder dysfunction. NOTE: There is a separate item for urinary tract infections.	0 1 2 3
Bowel dysfunction	Diarrhea, constipation, "accidents," and associated problems are signs of bowel dysfunction.	0 1 2 3
Urinary tract infections	This includes infections such as cystitis and pseudomonas. Symptoms include pain when urinating, a burning sensation throughout the body, blood in the urine and cloudy urine.	0 1 2 3
Sexual dysfunction	This includes dissatisfaction with sexual functioning. Causes for dissatisfaction can be decreased sensation, changes in body image, difficulty in movement, and problems with bowel or bladder, like infections.	0 1 2 3
Autonomic dysreflexia	Autonomic dysreflexia, sometimes called hyperreflexia, results from interference in the body's temperature regulating systems. Symptoms of dysreflexia include sudden rises in blood pressure and sweating, skin blotches, goose bumps, pupil dilation and headache. It can also occur as the body's response to pain where an individual doesn't experience sensation.	0 1 2 3
Postural hypotension	This involves a strong sensation of lightheadedness following a change in position. It is caused by a sudden drop in blood pressure.	0 1 2 3
Circulatory problems	Circulatory problems involve the swelling of veins, feet or the occurrence of blood clots.	0 1 2 3
Respiratory problems	Symptoms of respiratory infections or problems include difficulty in breathing and increased secretions.	0 1 2 3
Chronic pain	This is usually experienced as chronic tingling, burning or dull aches. It may occur in an area that has little to no feeling.	0 1 2 3
Joint and muscle pain	This includes pain in specific muscle groups or joints. People who must overuse a particular muscle group, such as shoulder muscles, or who put too much strain on their joints are at risk of developing pain.	0 1 2 3

For the following 16 health problems, please rate how much each one affected your activities and independence in the last 3 months. If you have not experienced a secondary condition in the last 3 months or if it is an insignificant problem for you, please circle "0." Use the following scale to rate each of the secondary conditions.
0 = NOT experienced in the last 3 months or is an insignificant problem.
1 = MILD or INFREQUENT problem.
2 = MODERATE or OCCASIONAL problem.
3 = SIGNIFICANT or CHRONIC problem.