

# Actionable Nuggets

## Knowledge translation tool for the needs of patients with spinal cord injury

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### Abstract

**Objective** To present the results of a pilot study of an innovative methodology for translating best evidence about spinal cord injury (SCI) for family practice.

**Design** Review of Canadian and international peer-reviewed literature to develop SCI Actionable Nuggets, and a mixed qualitative-quantitative evaluation to determine Nuggets' effect on physician knowledge of and attitudes toward patients with SCI, as well as practice accessibility.

**Setting** Ontario, Newfoundland, and Australia.

**Participants** Forty-nine primary care physicians.

**Methods** Twenty Actionable Nuggets (pertaining to key health issues associated with long-term SCI) were developed. Nugget postcards were mailed weekly for 20 weeks to participating physicians. Prior knowledge of SCI was self-rated by participants; they also completed an online posttest to assess the information they gained from the Nugget postcards. Participants' opinions about practice accessibility and accommodations for patients with SCI, as well as the acceptability and usefulness of Nuggets, were assessed in interviews.

**Main findings** With Actionable Nuggets, participants' knowledge of the health needs of patients with SCI improved, as knowledge increased from a self-rating of fair (58%) to very good (75%) based on posttest quiz results. The mean overall score for accessibility and accommodations in physicians' practices was 72%. Participants' awareness of the need for screening and disease prevention among this population also increased. The usefulness and acceptability of SCI Nugget postcards were rated as excellent.

**Conclusion** Actionable Nuggets are a knowledge translation tool designed to provide family physicians with concise, practical information about the most prevalent and pressing primary care needs of patients with SCI. This evidence-based resource has been shown to be an excellent fit with information consumption processes in primary care. They were updated and adapted for distribution by the Canadian Medical Association to approximately 50 000 primary care physicians in Canada, in both English and French.

### EDITOR'S KEY POINTS

- Actionable Nuggets are a useful method of translating knowledge about the special health care needs of people with spinal cord injury (SCI) for family physicians. The relevant information is presented in a manner that is useful and memorable so it can be incorporated easily into daily practice.
- Fifty-three percent of participants stated that they had made changes to their practices after receiving Actionable Nuggets; 75% said that they had had opportunities to apply information from Nuggets in practice. In particular, participants had improved their care of bladder function, upper extremity pain, autonomic dysreflexia, sexual health, and bowel care.
- Family physicians were willing to make accommodations and improve access for patients with SCI; recognized that many patients with SCI require additional time and consideration, special equipment, longer visits, and possibly home visits; and were aware they required specialized knowledge to care for patients with SCI.

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# Les pépites de savoir

*Un outil de transmission des connaissances sur les soins que requièrent les patients présentant une lésion de la moelle épinière*

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## Résumé

**Objectif** Présenter les résultats d'une étude pilote portant sur une nouvelle méthode pour transmettre aux médecins de famille les meilleures données probantes sur les lésions de la moelle épinière (LME).

**Type d'étude** Une revue de la littérature canadienne et internationale révisée par des pairs afin de créer des pépites de savoir sur les LME et une évaluation mixte qualitative-quantitative pour déterminer les effets de ces pépites sur les connaissances des médecins et sur leur attitude envers les patients présentant des LME, de même que sur l'accessibilité de ces patients à leur clinique.

### POINTS DE REPÈRE DU RÉDACTEUR

- L'utilisation des pépites de savoir représente un mode de transmission des connaissances avantageux pour le médecin de famille qui traite des personnes atteintes de lésions de la moelle épinière (LME). L'information pertinente y est présentée d'une façon utile et facilement mémorisable de sorte qu'elle puisse aisément être incorporée à la pratique quotidienne.

- Cinquante-trois pour cent des participants ont déclaré qu'ils avaient apporté des changements à leur pratique après avoir reçu ces pépites de savoir; 75 % ont dit avoir eu l'occasion d'utiliser les informations qu'ils contiennent dans leur pratique. Les participants avaient notamment amélioré leur façon de traiter la fonction vésicale, les douleurs des membres supérieurs, la dysréflexie, la santé sexuelle et l'activité intestinale.

- Les médecins de famille étaient disposés à faire des accommodements et à être plus accessibles aux patients souffrant de LME; ils étaient conscients qu'ils avaient souvent besoin de plus de temps et de considération, qu'ils nécessitaient des équipements spéciaux, des consultations plus longues et, éventuellement, des visites à domicile; ils étaient également conscients d'avoir besoin de certaines connaissances pour traiter ces patients.

Cet article fait l'objet d'une révision par des pairs.  
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**Contexte** L'Ontario, Terre-Neuve et l'Australie.

**Participants** Quarante-neuf médecins de première ligne.

**Méthodes** On a créé 20 pépites de savoir portant sur certains problèmes de santé observés chez les patients avec des LME en phase chronique. Ces pépites ont été postées sous forme de carte postale aux médecins participants pendant 20 semaines, à raison d'une par semaine. Les participants ont évalué eux-mêmes les connaissances qu'ils avaient déjà sur les LME et ils ont aussi complété un post-test en ligne afin d'évaluer l'amélioration de leurs connaissances résultant de ces pépites. À l'aide d'interviews, on a aussi évalué l'opinion des participants sur les accommodements accordés aux patients atteints de LME et sur l'accessibilité à leur clinique, de même que sur l'acceptabilité et l'utilité des pépites de savoir.

**Principales observations** Avec les pépites de savoir, les connaissances des participants sur les besoins de santé des patients atteints de LME sont passées d'un niveau initial acceptable (58 %), tel qu'estimés par les participants eux-mêmes, à très bon (75 %) selon les résultats du post-test. Dans l'ensemble, le score pour l'accessibilité et les accommodements observés dans les cliniques des médecins était de 72 %. Les participants étaient aussi plus conscients que ces patients nécessitaient davantage de mesures de dépistage et de prévention. L'utilité et l'acceptabilité des pépites de savoir sous forme de cartes postales étaient également jugées excellentes.

**Conclusion** Les pépites de savoir sont un outil de transmission des connaissances qui vise à fournir aux médecins de famille des informations concises et pratiques à propos des soins primaires les plus importants et urgents que requièrent les patients avec des LME. Cette ressource fondée sur des données probantes s'est avérée parfaitement adaptée aux processus de transmission de connaissances en contexte de soins primaires. Ces outils ont été mis à jour par l'Association médicale canadienne et adaptés pour être distribués à environ 50 000 médecins de première ligne au Canada, tant en anglais qu'en français.

When one of the more than 40000 Canadians living in the community with a spinal cord injury (SCI) faces a health problem, the first line of defence is usually the family physician.<sup>1-3</sup> However, the literature suggests that family physicians feel ill-equipped to deal with issues relating to SCI and the disability resulting from it.<sup>4-18</sup> Patients with SCI constitute a small percentage of the typical family medicine case load. As the prevalence of SCI is approximately 1.2 per 1000 population, the average family practice would have only 1 or 2 patients with SCI at a time.<sup>19-24</sup>

Although people with SCI use more health, family medicine, and specialist services than their contemporaries without disabilities do, they report that many of their needs are unmet, particularly for information and preventive health care.<sup>25-27</sup> These patients are among the 5% to 6% of the typical family medicine case load with multiple complex chronic conditions who consume about one-third of the practice's resources and who require multidisciplinary care.<sup>28,29</sup> There is good evidence for the effectiveness of a comprehensive annual health examination for patients with SCI in primary care.<sup>3</sup> Most of the issues raised in primary care relate to secondary complications of SCI, such as bowel or bladder dysfunction and pain. There are also many general health issues that require attention in this population, such as bone density, depression, and sexual and reproductive issues.<sup>3,26</sup>

In order to be able to provide optimal care to patients with SCI, family physicians need access to the best quality evidence available in a manner that is compatible with practice constraints and demands. The literature shows that family physicians have distinct preferences for information that provides incentives for learning (eg, continuing medical education credits) and that is focused, practical, action oriented, multifaceted, and credible through affiliation with opinion leaders.<sup>30</sup> The purpose of this study was to design and pilot-test an innovative methodology for translating the latest and best evidence about SCI for family physicians to use in practice.

## METHODS

### Development

The study involved the development of Actionable Nuggets—postcards pertaining to key health issues associated with long-term SCI. The intervention was designed so that 1 postcard would arrive weekly for 20 weeks at the offices of participating family physicians (**Figure 1**), thus providing needed information for optimal evidence-based care for patients with SCI, while at the same time raising awareness of the issues these patients face.

The development of Nuggets began with a scoping review of long-term health issues among people with SCI.<sup>31,32</sup> The literature review was conducted by an experienced librarian who used the following key words: *spinal*

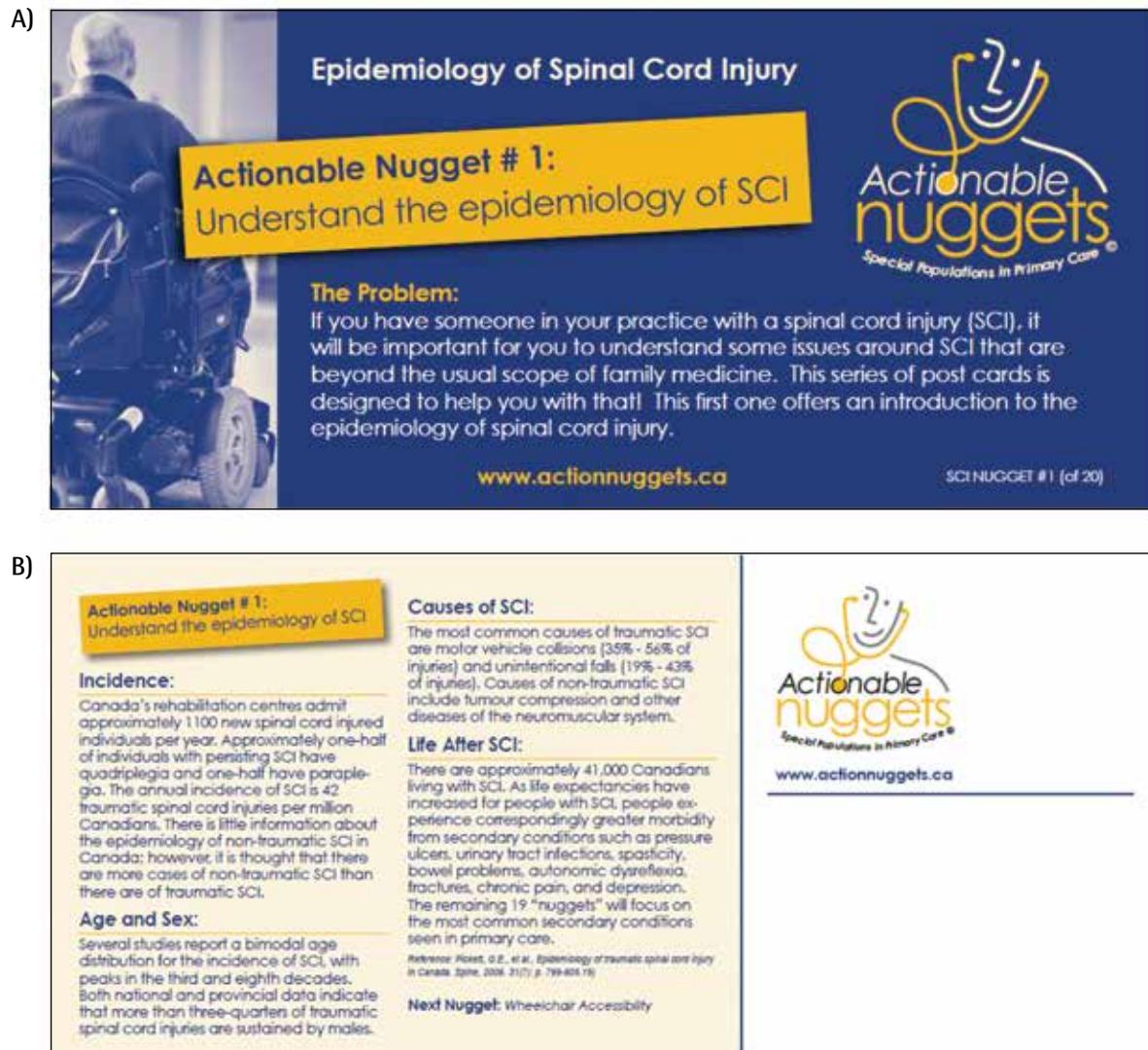
*cord injury, paraplegia, quadriplegia, tetraplegia; primary care, primary health care, family physician, family practice; long-term health, aging, health outcomes, health promotion, disease prevention, chronic disease management, long-term care, secondary complications; and evidence-based practice, best practice, clinical guidelines, and care guidelines.* Peer-reviewed journals were searched for the years 2000 to 2012 using CINAHL, MEDLINE, EMBASE, and the Cochrane Collaboration. In addition, the *CMAJ* and *Canadian Family Physician* were searched manually for any articles pertaining to secondary complications and long-term health issues associated with SCI, as well as best practice guidelines for any health issues associated with SCI (eg, urinary tract infection, chronic pain, bowel management). The search was concluded by hand searching through the reference lists of the final set of included references.

The initial search resulted in 4443 citations. Abstracts for all of these citations were reviewed by the staff epidemiologist (G.B.) and at least 1 investigator, and studies were selected for further analysis if they were available in English or French, focused on SCI, and specifically identified patients with SCI as part of the sample. Investigators were assigned to topics based on their expertise. After exclusion of 1658 duplicates, the data set was reduced to 2785 articles. At least 2 investigators scanned the full articles and further excluded 2124 articles because they did not focus on primary care (1358) or they did not explicitly provide data on individuals with SCI (766). No methodologic limitations were applied in order to ensure optimal coverage of the literature.

The remaining 661 articles were reviewed in detail and sorted into 11 key topics that represented either common or urgent health concerns of people with SCI. There is considerable consensus in the literature that these are the key issues for primary care<sup>3</sup>: pain, bladder management, bowel management, skin care, sexual and reproductive health, autonomic dysreflexia, cardiovascular disease, physical activity, depression or suicide, epidemiology, and office accessibility. Based on a thorough review of the pertinent literature associated with each topic, 20 Actionable Nuggets were drafted by the investigators and the staff epidemiologist. Multiple Nuggets were required for some topics; for example, the topic of pain resulted in 3 Nuggets: neuropathic pain versus musculoskeletal pain, pharmacologic management of pain, and chronic upper extremity pain. Nuggets were designed to address specific knowledge translation guidelines developed in previous research.<sup>33</sup> Standard levels of evidence were used to evaluate the data, but rigid criteria were not used to exclude information from consideration at subsequent steps.

Draft Nuggets were reviewed in detail by an expert panel made up of family physicians, rehabilitation specialists, epidemiologists, and knowledge translation specialists. The expert panel considered levels of

Figure 1. Sample of an Actionable Nugget: A) Front page, B) back page.



evidence, practicality in primary care, application in various primary care settings, and supports needed for implementation. Based on the expert panel's consensus recommendations, the Nuggets were revised and reviewed again. Each Nugget had to be approved by all 9 members of the expert panel before it was finalized. Each Actionable Nugget includes the following:

- a statement of a common problem that brings a person with SCI to see his or her family physician;
- a recommendation for action on the part of a family physician (ie, the Actionable Nugget itself);
- a description of evidence-based best practice in primary care in the area;
- a reproduced-with-permission statement, if applicable (eg, when a particular assessment or tool is mentioned

and is required for application of the Nugget, this is reproduced with permission of the original authors);

- a key reference, which often forms the basis for the action recommendation;
- a link to the Actionable Nuggets website, [www.actionnuggets.ca](http://www.actionnuggets.ca), where additional reference material can be found;
- the copyright date for each Nugget, so subscribers can judge how current the information on the Nugget is; and
- the Actionable Nuggets trademarked logo, artwork, and design.

### Pilot study

**Design.** A mixed qualitative-quantitative pilot test was

conducted to evaluate the usefulness and acceptability of the SCI Nuggets with a sample of family physicians. Nuggets were disseminated weekly to participating physicians, over a period of 20 weeks. Within 1 month following dissemination, physicians were contacted for data collection.

**Sample.** The pilot study engaged 49 primary care physicians from 3 research networks (the Atlantic Practice Based Research Network of Memorial University of Newfoundland in St John’s; the Network for Studies in Primary Care of Queen’s University in Kingston, Ont; and the Rural Clinical School Network of the University of New South Wales in Australia). Postcards were sent to network members (N=430) to identify eligible physicians who had at least 1 person with SCI in their practices; had been in practice at least 1 year; and had been the primary care physician for the designated patient for at least 1 year.

**Data collection.** Data were collected from participants approximately 1 month following completion of the series of 20 Actionable Nuggets. Qualitative and quantitative data were collected regarding participants’ knowledge of and attitudes toward patients with SCI, participants’ changes in practices, and participants’ opinions about the usefulness and acceptability of the Nuggets. (Further information about measures and detailed findings can be found at [www.actionnuggets.ca](http://www.actionnuggets.ca).)

**Knowledge:** Participants’ knowledge of SCI was assessed using a multiple-choice quiz designed specifically to test information gained from the Nuggets. The quiz was taken online and submitted electronically via the Nuggets website. The quiz consisted of 1 question for each of the 20 Nuggets, for a total of 20 questions. Physician participants also rated the importance and their prior knowledge of the issues that patients with SCI must face. (For a copy of this quiz, contact the corresponding author, M.A.M.)

**Attitudes:** Participants’ attitudes toward patients with disabilities were assessed in debriefing interviews. Their willingness to accommodate these patients or give them special consideration was assessed. These indicators are more robust than standardized measures of attitudes toward patients with disabilities, which are highly subject to social desirability bias, especially among well-educated samples.<sup>33</sup>

**Practice accessibility:** Practices to enhance access for patients with SCI were also assessed in the interviews, using the Primary Care Accessibility Assessment. This instrument has excellent psychometric properties, as well as a high degree of practice acceptance.<sup>30</sup>

**Acceptability and usefulness:** Acceptability and usefulness of Nuggets were also assessed in the debriefing interviews, seeking feedback, suggestions, and observations for revision of the Nuggets.

**Data analysis.** Analysis of quantitative data was conducted with SPSS, version 19.0, and consisted

primarily of computation of scores and averages. Qualitative data were analyzed using NVivo software to conduct descriptive content analysis of the transcripts of the debriefing interviews, to identify general themes in the physician comments, and to collect specific suggestions for improvements.

Ethical review was conducted and approval was granted by the 3 university research ethics boards.

## FINDINGS

Of the 430 research network members, 28% (n=122) responded to the initial postcard indicating eligibility. Practice leaders from each network followed up with eligible physicians and were successful in recruiting 49 (40%) to the study. **Table 1** provides descriptive information about the physicians who participated in the study and their practices.

### Knowledge

**Table 2**<sup>34</sup> shows the mean scores of participants’ pretest and posttest knowledge of key issues associated with long-term SCI care. The mean (SD) score for prior

**Table 1. Description of participating physicians: N = 49.**

CHARACTERISTICS	VALUE
Sex, %	
• Male	60
• Female	40
Mean time in practice, y	21
Region of practice, %	
• Ontario	37
• Newfoundland	24
• Australia	39
Practice location, %	
• Large urban (> 100 000)	11
• Small urban (10 000–99 999)	33
• Rural (< 10 000)	5
Practice type, %	
• Solo-practice physician	7
• Physician-only group	17
• Interdisciplinary group	21
• Other	4
Practice statistics	
• Mean no. of patients per physician	1446
• Mean no. of physicians in group	6.0
• Mean total practice case load	8267
• Mean no. of SCI patients per physician	1.8

SCI—spinal cord injury.

**Table 2. Physicians' mean rating of the importance of key issues associated with SCI and their mean pretest and posttest knowledge of the key issues: Mean (SD) overall score for pretest knowledge was 58% (3%) and mean (SD) overall score for posttest knowledge was 75% (4%).**

KEY ISSUES ASSOCIATED WITH SCI*	IMPORTANCE SCORE (OUT OF 5)	PRETEST KNOWLEDGE, % <sup>†</sup>	POSTTEST KNOWLEDGE, % <sup>‡</sup>
Bladder care <ul style="list-style-type: none"> <li>• Diagnosing UTI</li> <li>• Treating UTI</li> <li>• Screening for bladder cancer</li> <li>• Regular urologic follow-up</li> </ul>	4.70	71	74
Skin care <ul style="list-style-type: none"> <li>• Prevention of skin breakdown</li> <li>• Treatment of skin breakdown</li> </ul>	4.65	67	95
Office accessibility	4.65	50	73
Bowel care <ul style="list-style-type: none"> <li>• Annual assessment of neurogenic bowel</li> <li>• Constipation with neurogenic bowel</li> <li>• Periodic evaluation of bowel program</li> <li>• Screening for colorectal cancer</li> </ul>	4.61	71	75
Autonomic dysreflexia	4.27	50	77
Depression	4.22	78	86
Pain <ul style="list-style-type: none"> <li>• Neuropathic vs musculoskeletal pain</li> <li>• Management of neuropathic pain</li> <li>• Chronic upper extremity pain</li> </ul>	4.22	74	78
Physical activity	3.87	70	91
Sexual and reproductive health	3.70	60	55
Cardiovascular disease	3.70	77	57
Epidemiology	3.65	71	91

SCI—spinal cord injury, UTI—urinary tract infection.

\*These key SCI issues represent the 20 Actionable Nuggets.

<sup>†</sup>Before the program participants were asked to rate their level of knowledge for each of the 11 key topics from 1 (very limited) to 5 (expert knowledge). The mean score out of 5 for all respondents for each question was converted to a percentage.

<sup>‡</sup>The posttest contained 1 question for each of the 20 key issues. Values represent the proportion of physicians who answered the question or questions on that key topic correctly.

Adapted from Actionable Nuggets.<sup>34</sup>

knowledge was 58% (3%). Physicians believed they were most knowledgeable in the areas of depression, cardiovascular disease, and pain. Physicians believed they were least knowledgeable about SCI-specific issues such as autonomic dysreflexia, office accessibility, skin breakdowns, and sexual and reproductive health.

The mean (SD) score following review of the Nuggets was 75% (4%). Physicians were most successful on questions about bowel function assessment and management, treatment of skin breakdown, neuropathic pain, physical activity, and the demographic profile of SCI. Physicians performed least well on items relating to screening for colorectal cancer, sexual function, prevalence of pain with SCI, and cardiovascular disease prevention.

## Attitudes

The mean (SD) overall score for accessibility of practices

was 72% (15%) (**Table 3**).<sup>34</sup> Practices were least likely to be accessible in the following 5 areas: staff being familiar with procedures for assisting disabled patients (55%); having handrails in halls and stairways (52%); providing information products in accessible formats (42%); having adjustable examination tables (26%); and having lifts or hoists to assist with transfers (9%). Several participants referred specifically to increased awareness and sensitivity to the need for screening and disease prevention. The mean (SD) overall score for accommodations for patients with SCI was 79% (5%). A remarkable 96% stated that they would make home visits for their patients with SCI.

## Practice accessibility

After receiving the Actionable Nuggets, participants were asked about changes they made in their practices. Fifty-three percent of physicians stated that they had

**Table 3. Accessibility and accommodations in practice:** Mean (SD) overall score for accessibility in practices was 72% (15%) and mean overall score for physician accommodations was 79% (5%).

FACTORS	PROPORTION OF PHYSICIANS INDICATING YES
<b>Accessibility</b>	
Physical	
• Examination room has a wide door, providing room to maneuver	100
• Building has level entrance or ramp	96
• Outside doors are manageable and barrier free	96
• Signage is clear and legible	91
• There is an accessible washroom near examination room	87
• If office is not on ground floor, there is an elevator	81
• There are handrails on stairs and in hallways	52
• Examination table is adjustable	26
• Examination room has lift to assist with transfers	9
Interpersonal	
• Personal assistance available for transfers or dressing	83
• Information products are accessible	42
Expertise	
• Functional limitations are considered	91
• Familiarity with normal complications of SCI exists	86
• Aware of interaction with common health concerns	86
• Aware of benefits and supports	62
• Staff are familiar with procedures	55
<b>Accommodations</b>	
Home visits	96
Longer appointment times	91
Special timing of appointments	91
Emergency department visits	83
Telephone conversations	74
Telephone prescription renewals	74
After-hours appointments	70
Joint appointments with specialists	57

SCI—spinal cord injury.  
Adapted from Actionable Nuggets.<sup>34</sup>

made changes. “I used the cards [Actionable Nuggets] to organize a template for SCI clinic encounters, to help me give comprehensive care, and to ensure evidence-based preventative care.”

**Table 4. Acceptability and usefulness of Actionable Nuggets:** Overall mean (SD) score for the acceptability and usefulness of Nuggets was 4.7 (0.9).

CATEGORY	MEAN SCORE (OUT OF 5)
Professionalism	4.76
Appearance	4.61
Content	4.55
Accessible language	4.50
Compatible with needs of practice	4.48
Usefulness	4.22
Scientific rigour	4.13

When asked if they had had a chance to apply any of the information from the Nuggets, 75% of participants said that they had. In particular, participants had improved their care of bladder function, upper extremity pain, autonomic dysreflexia, sexual health, and bowel care. Many of the changes made were in areas in which specific practice tools were provided. Several participants noted that they were making changes to make their practices more accessible. “I did an accessibility audit of my practice [using the tool provided on the card], and asked my SCI patients whether they thought any changes were necessary.”

Thirty-three percent of participants indicated that they had made a referral as a direct result of the Nuggets, specifically to urologists (26%), occupational therapists (13%), physiatrists or physical medicine specialists (7%), physiotherapists (7%), and dietitians (7%).

### Usefulness and acceptability

We also asked participants for their opinions about the usefulness and acceptability of SCI Nuggets as a method of knowledge translation for primary care. To measure usefulness, we asked participants how many of the postcards they had actually read. Of the 20 Nugget postcards, participants read a mean (SD) of 16 (6.6) Nuggets. Two-thirds (65%) of participants said they reviewed all 20 Nuggets; 77% reviewed at least 15. The primary reason physicians offered for not reviewing the cards was time constraints. Also, 1 physician volunteered that he or she did not read cards that covered topics that were already familiar.

Based on 7 criteria derived from the literature for excellence in knowledge translation, participants were asked to rate the Nuggets from 1 (poor; not helpful) through 5 (excellent). The mean (SD) score for SCI Nugget usefulness was 4.7 (0.9) or 86% (Table 4). Participants rated the cards in the excellent range in all categories, with particularly high scores for professionalism, appearance, and content.

We also offered participating physicians access to the website [www.actionnuggets.ca](http://www.actionnuggets.ca), which included the references used to develop each Nugget (typically 20 to 40 references per Nugget) and details about the development

of Nuggets. Results showed that only 38% of participants visited the website, typically 2 to 4 times throughout the 20 weeks of the study. There appeared to be an effect of years in practice on tendency to visit the website. Those who visited the website only once were in practice for an average of 5.5 years, whereas those who visited the website 2 to 4 times were in practice for an average of 21.5 years, and the 1 participating physician who visited more than 5 times had been in practice for 31 years.

## DISCUSSION

This study addressed the need for specialized knowledge about subpopulations within primary care that have very low prevalence in the typical family practice. Actionable Nuggets are a knowledge translation tool designed to provide family physicians with concise, practical information about the most prevalent and pressing primary care needs of patients with SCI. This evidence-based resource has been shown to be an excellent fit with information consumption processes in primary care.<sup>30</sup> In particular, pilot study participants were responsive to the opportunity for continuing education credits and physician thought leadership.

Quantitative results showed that overall knowledge about the special health needs of patients with SCI in family practice went from fair (self-evaluation of 58%) to very good (mean test score of 75%). This finding is compatible with literature suggesting that family physicians are aware of their shortcomings with regard to this highly specialized population.<sup>3,16,27</sup> The improvement in knowledge is somewhat disappointing, given that the knowledge quiz was in effect an open-book test; that is, participants could complete it on their own time with resources at their disposal. As with many knowledge translation initiatives, there is no guarantee that transmitting the information ensures that it is received; however, uptake was monitored by self-report at posttest. Of greatest concern are those issues peculiar to SCI that have considerable consequences for health and quality of life, but where knowledge is not what it should be, such as for issues like autonomic dysreflexia, syringomyelia, and wheelchair or disability considerations.

With regard to attitudes, the findings in this pilot study were consistent with previous research.<sup>27</sup> Family physicians were willing to make accommodations and improve access; recognized that many patients with SCI require additional time and consideration, special equipment, longer visits, and possibly home visits; and were aware that they required specialized knowledge to care for patients with SCI. As in our previous research,<sup>27</sup> primary care settings tended not to be equipped with adjustable examining tables and lifts to permit patients using wheelchairs to transfer and be properly examined.

Subsequent research has shown that primary care practices are responsive to incentives to increase access, such as cost-sharing and legislative requirements.<sup>35</sup>

Participating physicians volunteered that they had substantially improved their awareness of their SCI patients and the issues such patients face. Several participants also indicated that they were sensitized to the need for access and redesign of aspects of their practices to accommodate patients with SCI and other mobility impairments. Further, several participants noted improved attention to prevention and referrals to appropriate specialists.

The usefulness and acceptability of SCI Nuggets were rated by participants as excellent. There was a strong preference for the hard-copy postcards with e-mail prompts. Several interesting suggestions emerged regarding alternative applications, CD backup, and review article summaries. Although the website was viewed as essential for background information, it was used very little, and consulted by less than half of the participants. Participants might thus have been largely unaware of the standards of evidence or process for development of Nuggets. The slightly lower score for scientific rigour reflects this lack of knowledge about the standards for evidence described on the website. On several occasions, the expert panel discussed including levels of evidence on the cards themselves but decided against it, as this would have considerably affected one of the most attractive features of Nuggets: their brevity. Instead, physicians interested in a higher degree of methodologic scrutiny were invited to avail themselves of additional information on the website.

## Limitations

Several limitations bear on the generalizability of these findings. First, this was a pilot study, with the explicit aim of developing and pilot-testing a novel knowledge translation vehicle for family physicians. The intervention in the pilot study cannot be considered causal, as appropriate controls were not implemented. Participants in the pilot study were volunteers from 3 primary care research networks who had at least 1 patient with SCI at the time of the study. This was a highly purposive sample and might not be representative of all family physicians. However, we do think that they are ideally positioned to provide expert opinions on the pilot study.

Another caveat is the specification that Nuggets are designed specifically for Canadian family physicians. The expert panel reflected this goal and did not include a variety of possible stakeholders and views, including the consumer perspective. Plans are under way to develop a companion product for consumers to assist them with interacting more effectively with their family physicians on important health issues.

A final limitation inherent in the Actionable Nuggets format is the inability to feature detailed information about levels of evidence on the postcards themselves. For those who wished to follow up on methodologic details of individual studies, users were invited to avail themselves of the additional information found on the website. The cards were designed to summarize multiple studies on a given topic and be easily and readily used in family practice.

## Conclusion

Based on the findings of the pilot study, it appears that Nuggets are a useful method of translating knowledge about the special health care needs of persons with SCI to family physicians. The relevant information is presented in a manner that is useful and memorable so it can be incorporated easily into daily practice. Actionable Nuggets for SCI were accredited by the College of Family Physicians of Canada for continuing education credits. They were distributed in English and French via the Canadian Medical Association's e-learning portal for 1 year (2013-2014), and are currently available to Canadian Medical Association members through the website [www.actionnuggets.ca](http://www.actionnuggets.ca). 🌿

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All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

## Competing interests

None declared

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