

SEXUAL HEALTH IN MEN WITH TRAUMATIC SPINAL CORD INJURIES:
A REVIEW AND RECOMMENDATIONS FOR PRIMARY HEALTH CARE PROVIDERS

By

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Abstract

Sexual health has been well-established as a salient and ongoing priority for men following traumatic spinal cord injury; yet it continues to be under-addressed by health care providers in both inpatient and community-based settings (Elliott, Hocaloski, & Carlson, 2017; Post & van Leeuwen, 2012; Simpson et al., 2012). Given that most men with traumatic spinal cord injuries will be followed by community-based primary care providers, including family physicians and nurse practitioners, for their long-term health care needs, these clinicians are well positioned to address ongoing sexual health issues with this population. This scoping review summarizes the recent literature on sexual health in men with traumatic spinal cord injuries as a means to offering evidence-based strategies to support primary care providers.

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Sexual Health in Men with Traumatic Spinal Cord Injuries: A Review and Recommendations for
Primary Health Care Providers

Introduction

The overwhelming majority of traumatic spinal cord injuries occur in young males under age 40, typically as a consequence of motor vehicle accidents, falls, sports-related injuries, or violence (Devivo, 2012; Hasler et al., 2012; Ibrahim, Lynne & Brackett, 2015; Singh, Tetreault, Kalsi-Ryan, Nouri & Fehlings, 2014). It is estimated that there are approximately 86,000 individuals currently living with traumatic spinal cord injuries in Canada, with 4,300 new cases reported each year. 80% of those affected are men, and the most common age of injury is between 20 to 29 years (Rick Hansen Institute, 2013).

Spinal cord injuries are life-altering experiences, with far reaching physical, emotional, psychological, and social consequences (Anderson, Borisoff, Johnson, Stiens & Elliott, 2007; Myburgh, Fourie & van Niekerk, 2010; Simpson et al., 2012). Given that young men who are typically at the pinnacle of their reproductive health comprise the vast majority of individuals who suffer traumatic spinal cord injuries, sexuality and fertility are frequently identified as salient concerns (Courtois et al., 2012; Ibrahim, Lynne & Brackett, 2015; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017).

Research has consistently demonstrated that sexual health is of major importance to quality of life after spinal cord injury, but it continues to be under-addressed by healthcare providers in both the inpatient and community-based settings (Anderson, Borisoff, Johnson, Stiens & Elliott, 2007; Elliott, Hocaloski, & Carlson, 2017; Post & van Leeuwen, 2012; Simpson et al., 2012). There exists a growing international body of literature stressing the importance of addressing sexual health, including fertility issues, for men with traumatic spinal cord injuries

within the formal rehabilitation setting. However, the ongoing role of primary care providers, including family physicians and nurse practitioners, in regard to these concerns has been largely overlooked and underexplored. Given that most men with traumatic spinal cord injuries are eventually followed by primary care providers in the community for their long-term health care needs, awareness of and attention to the importance of ongoing sexual health recovery should be integrated into routine primary care practice (Simpson et al., 2012).

This paper summarizes evidence from the recent literature focused on sexual health in men with traumatic spinal cord injuries. Also described are the main reasons why sexual health is currently under-addressed for these individuals. Drawing from this literature, evidence-based strategies for primary care providers caring for men with traumatic spinal cord injuries to better explore, assess, and manage sexual issues are summarized and discussed.

Methods

A scoping review is an approach to broadly examining the literature on a specific topic in order to rapidly detect emerging trends, summarize research findings, and identify gaps in the evidence (Arksey & O'Malley, 2005; Levac, Colquhoun, & O'Brien, 2010). Scoping reviews are particularly helpful in mapping an emerging field of knowledge supported by a wide range of different methods and study designs, which would not yet be amenable to a more precise systematic review (Khalil et al, 2016; Pham et al, 2014). Scoping reviews can be used to collect preliminary evidence that may inform clinical practice, guide policy development, and identify future research directions (Arksey & O'Malley, 2005).

The scoping review used in this paper was conducted according to the methodology proposed by Arksey and O'Malley, involving five stages: (1) identifying the research question, (2) identifying relevant studies, (3) selecting studies for inclusion, (4) charting the data, and (5)

summarizing and reporting the results (2005). The literature search was conducted using the electronic databases, MedLine and CINAHL with full text databases. For reference, a summary of the search strategy has been included below:

Keywords used: (MM field code: MedLine Exact subject heading; DE field code: CINAHL subject heading)

- Sex* N2 (recover* OR Issue* OR problem* OR rehab* OR manage* OR health*)
- Spin* N2 injur*
- MM "Sexuality" OR MM "Sexual Dysfunction, Physiological" OR MM "Sexual Dysfunctions, Psychological"
- MM "Spinal Cord Injuries"

The search retrieved a total of 931 articles. The titles and abstracts were reviewed for relevancy according to pre-established inclusion criteria. The inclusion criteria were literature published from 2007 to 2018; English language; and literature and/or research focused specifically on men (or a majority population of men) with spinal cord injuries.

20 pieces of literature met the inclusion criteria and comprised the data for this scoping review (see Table 1). They included journal articles (n=19) and clinical practice guidelines (n=1). The reference lists of these pieces of literature were also reviewed in order to get a sense of the seminal articles on this topic, and to identify the major clinical and research contributors. Four main themes emerged from the literature review and form the basis of this paper: (1) patterns and diversity of sexual health concerns in men with traumatic spinal cord injuries; (2) sexual health recovery as an ongoing priority; (3) clinical barriers to addressing sexual health concerns, and (4) recommended interventions and strategies for health care providers.

1. Patterns and Diversity of Sexual Health Concerns in Men with Traumatic Spinal Cord Injuries

Following traumatic spinal cord injury, most men experience severe impairments in their sexual health and reproductive functioning due to erectile and/or ejaculatory dysfunction, and

semen abnormalities (Čehić et al., 2016; Sinha, Elliott, Ibrahim, Lynne & Brackett, 2017). Many men also report decreased libido, anorgasmia, and in some cases dyspareunia (Burns, Hough, Boyd, & Hill, 2010; Burns, Mahalik, Hough, & Greenwell, 2008; Cobo Cuenca, Sampietro-Crespo, Virseda-Chamorro, & Martin-Espinosa, 2014; Hess & Hough, 2012).

The degree of individual sexual dysfunction depends on the level and severity of the spinal cord injury, and the period of time that has passed since the injury itself (Cobo Cuenca, Sampietro-Crespo, Virseda-Chamorro, & Martin-Espinosa, 2014; Hess & Hough, 2012; Previnaire et al., 2017). The T11-12 sympathetic, the S2-4 parasympathetic, and the somatic centres have been identified as the three spinal segments that are particularly important for sexual function. Disruptions to these pathways result in predictable alterations in the ability of men to achieve erection, ejaculation, and orgasm (Previnaire et al., 2017). Research has shown that up to 95% of men with spinal cord injuries experience persistent ejaculatory problems, such as anejaculation or retrograde ejaculation, but almost 80% regain some degree of erectile function by two years after injury (Hess & Hough, 2012). In addition, although the majority of men with traumatic spinal cord injuries maintain normal sperm concentrations, they often have injury-related low sperm motility and viability, which significantly contribute to very high rates of infertility in this population (Čehić et al, 2016; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017). It has been well established that these sexual concerns relate to varying degrees of psychological distress and long-term adjustment difficulties in men with traumatic spinal cord injuries (Barbonetti, Cavallo, Felzani, Francavilla, & Francavilla, 2008).

There are both pharmacological and non-pharmacological treatment options for men with traumatic spinal cord injuries depending on the type of sexual dysfunction they experience. For most men with spinal cord injuries, the basic mechanisms for erection are preserved, including

normal vasculature and an intact S2-4 reflex arc (Čehić et al, 2016; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017; Steadman & Hubscher, 2016). As such, they are often able to have reflex erections, but not psychogenic erections (Barbonetti, Cavallo, Francavilla, & Francavilla, 2008; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017). These men typically respond well to the same pharmacological treatments used for the management of erectile dysfunction in men without spinal cord injuries, namely oral phosphodiesterase-5 inhibitors (PDE-5 inhibitors) such as sildenafil, vardenafil, and tadalafil (Čehić et al, 2016; Ibrahim, Lynne, & Brackett, 2015). Approximately 70% of men with spinal cord injuries respond to PDE-5 inhibitors, and most experts recommend that all men with spinal cord injuries be offered a trial of these agents, regardless of their level of injury (Ibrahim, Lynne & Brackett, 2015). In men who do not get an adequate response with PDE-5 inhibitors, other potential options include the use of specialized vacuum devices, intracavernosal injections, or surgical penile prostheses (Čehić et al, 2016; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017).

The vast majority of men with traumatic spinal cord injuries are unable to ejaculate with sexual intercourse (Steadman & Hubscher, 2016). They also frequently have abnormal semen profiles (Čehić et al, 2016). In order to procure sperm for artificial insemination, specialty techniques such as penile vibratory stimulation (PVS) or electroejaculation (EEJ) have been shown to be extremely effective (Ibrahim, Lynne, & Brackett, 2015; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017). Patients undergoing these procedures must do so in specialty clinics where they can be monitored and treated for any potential complications, such as autonomic dysreflexia (Čehić et al, 2016; Ibrahim, Lynne, & Brackett, 2015). In cases where PVS and EEJ are ineffective or not tolerated, surgical sperm retrieval is considered a last resort (Čehić et al, 2016; Steadman & Hubscher, 2016). Despite impairments to semen quality in men with spinal

cord injuries, modern advances in assisted reproductive technologies, including intravaginal insemination, intrauterine insemination, and in vitro fertilization have resulted in favourable pregnancy rates (Čehić et al, 2016; Sinha, Elliott, Ibrahim, Lynne, & Brackett, 2017).

Beyond the well-known physiological changes that cause sexual dysfunction in men with traumatic spinal cord injuries, there are several other factors which have been found to have a potential impact on their sexual response and function. These factors include individual characteristics, such as post-injury self-esteem and body image, relationship status, previous sexual attitudes and experiences, and openness to sexual experimentation (Čehić et al, 2016; Eisenberg, Andreski, & Mona, 2015; Hess & Hough, 2012; Lombardi, Macchiarella, Cecconi, Aito, & Del Popolo, 2008). There is also some evidence to show that men's adherence to traditional masculine norms may affect their adjustment to changes in their sexual functioning following spinal cord injury (Burns, Hough, Boyd, & Hill, 2010). For example, adherence to masculine scripts that stress the salience of men's sexual capacity and potency may exacerbate feelings of depression, loss, insecurity, and inadequacy, which may hinder an individual's ability to make a healthy adjustment to changes in his sexuality (Burns, Hough, Boyd, & Hill, 2010; Burns, Mahalik, Hough, & Greenwell, 2008). Similarly, research has demonstrated that adherence to masculine norms that promote excessive self-reliance or independence increases men's negative perceptions of their post-spinal cord injury physical limitations, impedes their willingness to engage with emotional and social supports, and results in higher rates of depression (Burns, Hough, Boyd, & Hill, 2010). In order to try to address these concerns, interventions, including sex education, counselling (both individual and couple's counselling), cognitive behavioural therapy, sex therapy, and peer support are often beneficial (Consortium for Spinal Cord Medicine, 2010; Eisenberg, Andreski, & Mona, 2015; Post & van Leeuwen, 2012).

2. Sexual Health Recovery as an Ongoing Priority

In the past two decades, advances in the field of rehabilitation and physical medicine have resulted in tremendous improvements in the life expectancies and quality of life of individuals with traumatic spinal cord injuries, including better prevention strategies for pressure sores and skin breakdown, more effective treatments for neuropathic pain and spasticity, as well as developments in technologies that optimize mobility (Čehić et al, 2016; Ibrahim, Lynne, & Brackett, 2015; Lombardi, Macchiarella, Cecconi, Aito, & Del Popolo, 2008). The benefits of these advancements are significant, but it is essential for health care professionals and researchers to recognize that there can be mismatches in what providers vs. patients triage as the most important clinical and research priorities (Simpson et al., 2012). One example is sexual health, which has been consistently identified as a salient component of quality of life and well-being for men with traumatic spinal cord injuries; yet it continues to be inadequately addressed by healthcare providers in both inpatient and community-based settings (Elliott, Hocaloski, & Carlson, 2017; Hess & Hough, 2012; Post & van Leeuwen, 2012; Simpson et al., 2012; Steadman & Hubscher, 2016).

A systematic review by Simpson et al (2012) examining 24 studies that directly surveyed individuals with spinal cord injuries about their health and life priorities found that restoration of sexual function was consistently identified as a top priority. Most studies included in this review comprised a mix of male and female participants. That being said, men consistently represented the majority of the study populations, with the reported percentage composition of males ranging from 50-88%. Another recent study looking at the most salient health problems reported by individuals with spinal cord injuries at 1 and 5 years post discharge from first inpatient rehabilitation demonstrated that sexuality was one of their most frequently identified and

ongoing concerns (Van der Meer et al., 2017). A study by Anderson et al (2007) surveying 286 individuals with spinal cord injuries, approximately 70% of whom were male, found that more than 80% of participants felt that their spinal cord injury had affected their sexual sense of self, and that improvements in their sexual function would significantly improve their quality of life. In addition, research has shown that concerns around sexual health and functioning continue to be important to males over 50 years of age with longstanding spinal cord injuries of at least 20 years, although their specific interests and needs may vary compared to younger men (Lombardi, Macchiarella, Cecconi, Aito, & Del Popolo, 2008).

These research findings provide strong evidence that sexual health is a significant and ongoing priority for men with traumatic spinal cord injuries, which has major implications on their subjective quality of life (Simpson et al, 2012). As such, it compels both clinicians and researchers to work assiduously to better address sexual health recovery for this population.

3. Clinical Barriers to Addressing Sexual Health Concerns

In 2000, the World Health Organization identified sexual health as a fundamental right of all individuals. They defined sexual health as “a state of physical, emotional, mental, and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction, or infirmity” (2018). Additionally, for the past 30 years the American Occupational Therapy Association has identified sexuality as an activity of daily living, which inherently establishes it as an important priority in rehabilitation medicine (Elliott, Hocaloski, & Carlson, 2017; Pieters, Kedde, & Bender, 2017).

There are several reasons implicated for health care providers under-addressing sexual health in men with traumatic spinal cord injuries. One main reason is the overall lack of formal sexual rehabilitation services existing in both inpatient and community settings. There are

numerous programs for bowel and bladder management following spinal cord injury; yet the availability of programs in the area of sexual health is generally lacking (Anderson, Borisoff, Johnson, Stiens & Elliott, 2007; Consortium for Spinal Cord Medicine, 2010; Pieters, Kedde, & Bender, 2017). There do exist a few rehabilitation centres in Canada with highly specialized sexual health rehabilitation services, such as GF Strong in Vancouver, British Columbia, but these programs tend to be located in large, urban areas, making them challenging to access for individuals living in more remote communities. The programs also tend to have high demand, often resulting in considerable wait lists. Research has also shown that for many men with traumatic spinal cord injuries, concerns regarding their sexual health become increasingly important in the months and years following injury (Burns, Mahalik, Hough, & Greenwell, 2008; Consortium for Spinal Cord Medicine, 2010; Hess & Hough, 2012). Therefore, although inpatient sexual rehabilitation services (when they exist) are highly beneficial, individuals with spinal cord injuries identify a widespread need for ongoing access to sexual rehabilitation services following discharge into the community (New, Seddon, Redpath, Currie, & Warren, 2016).

Another reason likely relates to the fact that there is little consensus around when, how, and who should be addressing concerns related to sexuality and fertility (Consortium for Spinal Cord Medicine, 2010; Pieters, Kedde, & Bender, 2017). Research with health care providers has established that they often perceive many barriers to discussing sexuality with their patients. These barriers include perceived deficits in their knowledge and expertise, discomfort in asking about and addressing sexual concerns, lack of time and/or adequate reimbursement, and perception of expertise elsewhere (Elliott, Hocaloski, & Carlson, 2017; New, Seddon, Redpath, Currie, & Warren, 2016; Pieters, Kedde & Bender, 2017). In addition, health care professionals

often wait for patients to raise concerns about sexuality (Pieters, Kedde, & Bender, 2017). Many patients feel embarrassed about bringing up the topic of sexuality, are unclear about which provider is appropriate to answer their questions, and/or feel uncertain about the receptivity of their provider to engage in a discussion about their sexual health (Elliott, Hocaloski, & Carlson, 2017). Consequently, most men with traumatic spinal cord injuries expect that their health care providers will initiate the topic, and therefore often end up experiencing a lack of opportunity to ask questions about their sexuality (Pieters, Kedde, & Bender, 2017).

Finally, there is ample evidence to suggest that existing societal stigmas or misperceptions, which view individuals with disabilities as asexual, contribute barriers to the provision of sexual health rehabilitation to men with traumatic spinal cord injuries (Eisenberg, Andreski, & Mona, 2015; New, Seddon, Redpath, Currie, & Warren, 2016).

4. Recommended Interventions and Strategies for Health Care Providers

For the aforementioned reasons, increasing numbers of international experts in the field of sexual rehabilitation and fertility have called for the establishment of standardized multidisciplinary approaches to sexual health in the rehabilitation setting (Elliott, Hocaloski, & Carlson, 2017; Hess & Hough, 2012; New, Seddon, Redpath, Currie, & Warren, 2016; Pieters, Kedde, & Bender, 2017). Given the complex nature of sexual health, most experts recommend a biopsychosocial approach to sexual health care, incorporating the expertise and perspectives of various disciplines, including physicians, occupational therapists, physiotherapists, psychologists, sexual therapists, nurses, social workers, and peer support workers, among others (Consortium for Spinal Cord Medicine, 2010; Elliott, Hocaloski, & Carlson, 2017; Pieters, Kedde, & Bender, 2017). It is thought that by sharing the responsibility for the initial management of sexual concerns across a multidisciplinary team in rehabilitation centres, the

onus is taken off any one individual provider, and the opportunity for a holistic approach to sexual health care is optimized (Elliott, Hocaloski, & Carlson, 2017; Pieters, Kedde, & Bender, 2017).

Interestingly, there is a gap in the literature related to the potential ongoing role and responsibility of primary care providers, including family physicians and nurse practitioners, in addressing the sexual health concerns of men with traumatic spinal cord injuries in the community setting. Given that most men with traumatic spinal cord injuries in Canada will eventually be followed by primary care providers in the community for their long-term health care needs, these clinicians are well positioned to maintain ongoing dialogue and support related to sexual health recovery for these patients post discharge from rehabilitation. Research has demonstrated that most men continue to express concerns about their sexuality in the years following traumatic spinal cord injury, which demonstrates that this is an enduring health priority that is therefore highly relevant to primary care (Burns, Mahalik, Hough, & Greenwell, 2008; Consortium for Spinal Cord Medicine, 2010; Van der Meer et al., 2017).

The majority of literature that exists around improving health care providers' awareness of and attention to sexual health in men with traumatic spinal cord injuries has focused on the formal rehabilitation setting. That being said, many of the proposed evidence-based strategies are applicable to and helpful for family physicians and nurse practitioners working with these patients in the community. Currently, formal evaluations of these strategies and interventions are generally lacking in the literature, pointing to a need for ongoing research to establish their effects on target populations.

The P-LI-SS-IT model is a useful framework for clinicians to apply in order to approach patients' sexual concerns and to know when to refer (Consortium for Spinal Cord Medicine,

2010). It was originally created by Dr. Jack Annon in 1976, and it continues to be commonly used by sexual health teams and practitioners (Eisenberg, Andreski, & Mona, 2015). The P-LI-SS-IT model represents four stages of increasing questioning and intervention related to sexual issues, including permission (P), limited information (LI), specific suggestions (SS), and intensive therapy (IT) (Eisenberg, Andreski, & Mona, 2015; New, Seddon, Redpath, Currie, & Warren, 2016). As the level of intervention increases, the required knowledge, skill, and expertise on behalf of the clinician also increases (Consortium for Spinal Cord Medicine, 2010; Eisenberg, Andreski, & Mona, 2015). Permission is the first level of intervention, and it can generally be done by any willing health care provider. It involves the clinician verbally giving patients permission to bring up sexual issues and legitimizes their concerns. Normalization is a key component to the success of this intervention because it confirms to patients that they are not alone or unusual for having sexual health concerns, and encourages ongoing discussion (Eisenberg, Andreski, & Mona, 2015). The second level of intervention is limited information, which is when the clinician provides the patient with factual information that is directly relevant to their particular sexual issue. In the case of men with spinal cord injuries, this could include awareness of some of the commonly related sexual dysfunctions, or knowledge of available sexual health services in the local community. In order to provide the third level of intervention, specific suggestions, the clinician must have some training in sexual health such that they can offer appropriate therapies or recommendations for a client's specific concerns. For example, this could include offering a man with a spinal cord injury a trial of a PDE-5 inhibitor for erectile dysfunction. Finally, intensive therapy involves highly specialized assessment and treatment, which is typically limited to dedicated sexual health clinicians or other specialists with specific training and experience (Consortium for Spinal Cord Medicine, 2010). According to the P-LI-

SS-IT model, many family physicians and nurse practitioners could confidently support men with sexual concerns related to traumatic spinal cord injuries up to the second or third levels of intervention.

It is important for primary care providers to be aware of the barriers that result in sexuality being currently under-addressed for men with traumatic spinal cord injuries. For example, understanding that the vast majority of men with traumatic spinal cord injuries report a desire to discuss concerns around their sexual health, but they expect their health care providers to bring up the topic may encourage family physicians and nurse practitioners to initiate conversations with these patients (Pieters, Kedde, & Bender, 2017). Introducing the topic of sexual health in a straightforward and nonjudgmental way can help to normalize the conversation, which makes patients feel more comfortable asking questions related to their sexual health (Consortium for Spinal Cord Medicine, 2010). Experts recommend that clinicians say something like: “Many men with spinal cord injuries have questions or concerns about their sexual health. I am always open to discussing this with you, and/or referring you to other appropriate clinicians or resources.” In this way, the health care practitioner gives the patient ongoing permission to access assistance in adjusting to changes in his sexual function. It is also important for clinicians to start the initial conversation with patients using neutral language, such as “partner” instead of “girlfriend/boyfriend,” and to avoid making early assumptions around an individual’s sexual preferences or practices (Consortium for Spinal Cord Medicine, 2010).

Depending on the personal knowledge and expertise of the primary care provider, he or she may feel more or less comfortable discussing sexual health concerns and specific treatment options for men with traumatic spinal cord injuries. Some of the topics that have been recommended in the literature to be included in formal sexuality rehabilitation for men with

spinal cord injuries include information on birth control, sexually transmitted infections, safe sex practices, facilitating communication about changes in sexual function, relationship goals, erectile and ejaculatory dysfunction, fertility changes, and appropriate modifications/options for sexual activity (Consortium for Spinal Cord Medicine, 2010; New, Seddon, Redpath, Currie, & Warren, 2016). Many of these concerns are well within the scope and expertise of family physicians and nurse practitioners.

There are also many excellent Canadian and international resources available, which can help support primary care clinicians in developing their basic understanding of sexual dysfunction specifically associated with spinal cord injury, as well as providing them with guidance on how to identify and address sexual health concerns and when to refer. The SCIRE (Spinal Cord Injury Research Evidence) website for health care professionals has several videos by experts on sexual health and spinal cord injury on topics including how to assess sexual health after spinal cord injury, basic sexual medicine principles for recovery, and the P-LI-SS-IT model. They can be accessed at <https://scireproject.com/videos/how-to/>. In addition, the Sexual Health Rehabilitation Service (SHRS) at GF Strong Rehabilitation Centre has created an online course called “Sexual Health in Healthcare: Tips for Breaking the Ice,” which is open to health care professionals within all of the provincial health authorities. This course is meant to support health care providers working outside of the formal rehabilitation setting to begin identifying and addressing sexual health concerns in their patients with disabilities or chronic illnesses. The Sexual Medicine Society of North America website, <http://www.sexhealthmatters.org>, is a good resource for both health care providers and patients, and includes information about sexual health concerns related to specific conditions, including spinal cord injuries in men. Finally, the 2010 clinical practice guidelines created by a group of multidisciplinary, international experts from the

Consortium for Spinal Cord Medicine can be accessed at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2941243/>. These guidelines provide comprehensive, evidence-based recommendations for health care practitioners caring for individuals with spinal cord injuries to initiate conversations about sexual health, and to assess and manage sexual dysfunction.

It is also essential for primary care providers to be familiar with the resources and specialty services available in their communities to address specific sexual health and fertility concerns of men with traumatic spinal cord injuries so that they can refer appropriately (Consortium for Spinal Cord Medicine, 2010). Depending on the location, these could include specialized sexual health rehabilitation programs, sexual health nurses, sex therapists, physiotherapists, counsellors, occupational therapists, urologists, physical medicine and rehabilitation physicians, and fertility specialists.

Conclusion

It is clear that sexual health is a priority for many men with traumatic spinal cord injuries, which is currently inadequately addressed by health care providers. Interestingly, the roles and responsibilities of community-based primary care providers, including family physicians and nurse practitioners, in supporting these patients' long-term sexual and reproductive health and rehabilitation goals have been largely overlooked in the literature. By virtue of their scope of practice, accessibility, and ability to maintain ongoing therapeutic relationships with patients in the community, primary care providers are ideally situated to compliment the work of multidisciplinary rehabilitation teams by providing men with traumatic spinal cord injuries with ongoing assessment, management, and referrals for their sexual health needs.

This paper has focused specifically on men with traumatic spinal cord injuries, but it is important to recognize that many other chronic illnesses and disabilities commonly encountered in the primary care setting are also associated with significant sexual health problems. Conditions including cancer, arthritis, multiple sclerosis, Parkinson's disease, diabetes, and depression frequently lead to changes in sexual health for both men and women, which also tend to be under-addressed (Eisenberg, Andreski, & Mona, 2015; Pieters, Kedde, & Bender, 2017). The evidence-based strategies described in this paper to support primary care providers in exploring, assessing, and managing sexual issues in men with traumatic spinal cord injuries, could certainly also be of relevance in the care of patients with other chronic illnesses and conditions (Elliott, Hocaloski, & Carlson, 2017; New, Seddon, Redpath, Currie, & Warren, 2016).

Primary care providers who take up this practice should be supported and commended for their contributions to men's health, and by extension the health of their families. Given that sexuality is a fundamental component of human well-being, promoting sustainable and accessible interventions that improve men's sexual health in the context of traumatic spinal cord injuries should be fully integrated to primary health care.

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Appendix

This culminating project is part of the degree requirements for the Master of Nursing – Nurse Practitioner Program at the University of British Columbia. For completion of this project, a manuscript based on this scoping review and its findings has been developed for submission for publication. The intention of submitting a manuscript for publication is to create awareness amongst primary health care providers, including family physicians and nurse practitioners, of the salience of ongoing sexual health recovery in men with traumatic spinal cord injuries, and to provide them with evidence-based strategies to better explore, assess, and manage sexual health issues with these patients in the community.

Table 1: Literature included in the scoping review

<i>Author(s)/Year</i>	<i>Type of literature, location, sample</i>	<i>Results</i>
Anderson, Borisoff, Johnson, Stiens, & Elliott (2007)	Cross sectional survey; worldwide web; individuals \geq living with spinal cord injuries (69.6% males)	More than 80% of participants felt that their spinal cord injury altered their sexual sense of self, and that improvements in their sexual functioning would improve their quality of life
Barbonetti, Cavallo, Felzani, Francavilla, & Francavilla (2008)	Cross sectional study evaluating psychological distress features in men with traumatic spinal cord injuries with or without erectile dysfunction; Italy, 40 men with neurologically stable traumatic spinal cord injuries who were admitted to a rehabilitation program	Erectile dysfunction was identified as the main determinant of psychological distress in men with traumatic spinal cord injury
Burns, Hough, Boyd, & Hill (2010)	Cross sectional survey; worldwide web; 116 men with spinal cord injuries	Men's adherence to masculine norms influence their adjustment to spinal cord injuries. Higher rates of depression are observed in men with spinal cord injuries who adhere to masculine norms fostering excessive independence that limits access to emotional and functional supports
Burns, Mahalik, Hough, & Greenwell (2008)	Review article highlighting how men's adherence to gender scripts for sexual potency may contribute to their adjustment following a spinal cord injury	Description of how men's adherence to gender norms around sexual potency may influence their post-injury mental health. Discussion of gender-sensitive interventions and future clinical research
Čehić et al. (2016)	Review article focusing on fertility issues in men with spinal cord injury	The majority of men with spinal cord injuries experience impairments in sexual and reproductive functions due to erectile/ejaculatory dysfunction and semen

		abnormalities. Nevertheless, favourable pregnancy rates have been achieved with the use of assisted methods for semen retrieval and assisted reproductive technologies
Cobo Cuenca, Sampietro-Crespo, Virseda-Chamorro, & Martin-Espinosa (2014)	Case control study assessing the different types of sexual dysfunction, quality of life, depression, anxiety, and levels of self-esteem in men with sexual dysfunction with and without spinal cord injury; Spain; 165 men with sexual dysfunction (85 with spinal cord injury, and 80 without spinal cord injury)	Men with spinal cord injuries report less satisfaction with sexuality and employment status
Consortium for Spinal Cord Medicine (2010)	Clinical Practice Guidelines for Health-Care Professionals	Evidence-based recommendations for health care-professionals to address sexuality and reproductive health in adults with spinal cord injuries
Eisenberg, Andreski, & Mona (2015)	Review article on addressing sexuality and physical disability within health care	Evidence-based strategies for health care providers working with individuals with disabilities to better address their sexual health needs
Elliott, Hocaloski, & Carlson (2017)	Journal article describing a proposed multidisciplinary approach to sexual and fertility rehabilitation for individuals with spinal cord injuries	Description of the evidence-based, multidisciplinary Sexual Rehabilitation Framework
Hess & Hough (2012)	Review article on the impact of spinal cord injury on sexuality (both male and female)	Description of sexual dysfunction commonly experienced by individuals with spinal cord injuries, and a discussion of possible interventions
Ibrahim, Lynne, & Brackett (2015)	Review article on male fertility following spinal cord injury	Erectile dysfunction, ejaculatory dysfunction, and abnormal semen quality are major contributors to infertility in men with spinal cord injury. Discussion of

		evidence-based treatment options for infertility in this population
Lombardi, Macchiarella, Cecconi, Aito, & Del Popolo (2008)	Cross sectional study examining at the sexual health concerns of male patients with spinal cord injury over 50 years of age with spinal lesions of at least 20 years; Italy; 110 male subjects	Concerns around sexual health and functioning continue to be important to males over 50 years of age with longstanding spinal cord injuries of at least 20 years, although their specific interests and needs may vary compared to younger men
New, Seddon, Redpath, Currie, & Warren (2016)	Mixed methods study using survey and semi-structured interviews to examine the experiences of sexual education during rehabilitation for people with spinal cord injuries; Australia; 72% male	Individuals with spinal cord injury reported low satisfaction with sexuality education during rehabilitation
Pieters, Kedde, & Bender (2017)	Pre-test post-test design examining the impact of a specialized training program for rehabilitation teams in sexual health care; Netherlands	Providing rehabilitation teams with a formal training program in sexual health care helped to integrate sexual health in the overall care for rehabilitation patients
Post & van Leeuwen (2012)	Literature review on life satisfaction and mental health outcomes in individuals with spinal cord injuries.	Individuals with spinal cord injuries experience higher levels of distress and lower levels of life satisfaction compared with the general population
Previnaire et al. (2017)	Four case reports demonstrating the impact of spinal cord injury on sexual responses and course of treatment (3 males)	Neurological examination combined with reflex testing allows for prediction of sexual responses after spinal cord injury
Simpson et al. (2012)	Systematic review examining 24 studies that directly surveyed people with spinal cord injuries to identify their health/life priorities. Men consistently represented the majority of study populations (50-88%)	Restoration of sexual function was consistently identified as a top priority (within the top 25%) for individuals with spinal cord injuries

Sinha, Elliott, Ibrahim, Lynne & Brackett (2017)	Review article addressing issues that health care providers should consider when managing the reproductive health of men with spinal cord injury	Description of sexual dysfunction commonly seen in men with spinal cord injury, and evidence-based interventions
Steadman & Hubscher (2016)	Review article discussion sexual function after spinal cord injury in both males and females	Discussion of patterns of sexual function following spinal cord injury. Provided evidence-based suggestions around appropriate assessment and treatment
Van der Meer et al. (2017)	Multicenter, prospective cohort study looking at the most salient health problems reported by individuals with spinal cord injuries at 1 and 5 years post discharge from first inpatient rehabilitation; Netherlands; 69.1% of participants were male	Sexuality was one of the most frequently identified and ongoing concerns of individuals with spinal cord injuries at 1 and 5 years post discharge from first inpatient rehabilitation.