TOPICS IN
SCI Rehabilitation for Primary Care Providers

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FUNDED BY

Academy of Spinal Cord Injury Professionals, Inc.
Craigh NeilSEN Foundation
American Spinal Injury Association
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<tbody>
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Primary Care for Persons with Spinal Cord Injury or Disease

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The presenters have no financial conflicts of interest relative to this presentation.
Goals and Learning Objectives

1) Review basic demographics of spinal cord injury (SCI)

2) Present data on outpatient health care utilization by people with SCI

3) Discuss major “secondary effects” of SCI and basic management

4) A call to action and advocacy
Spinal Cord Injury (SCI) Demographics

- Approximately 17,730 new cases of SCI/yr in the United States
- Approximately 291,000 people in the United States living with SCI
- Average age at injury is 43; 78% of recent injuries are in men
- MVA accounts for 39.3% of SCI; falls for 31.8%

http://nscisc.uab.edu/Public/Facts%20and%20Figures%202019%20-%20Final.pdf
Health Care Utilization

Life Expectancy in SCI

<table>
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<tr>
<th>Injury Category</th>
<th>Life Expectancy at 20 Years</th>
<th>Life Expectancy at 40 Years</th>
<th>Life Expectancy at 60 Years</th>
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<tr>
<td>No spinal cord injury</td>
<td>60.6</td>
<td>41.7</td>
<td>24.1</td>
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<tr>
<td>Motor functional at any level AIS D</td>
<td>53</td>
<td>35.3</td>
<td>19.5</td>
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<tr>
<td>Paraplegia AIS ABC</td>
<td>46</td>
<td>30</td>
<td>16.4</td>
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<tr>
<td>Low tetraplegia (C5–C8) AIS ABC</td>
<td>40.9</td>
<td>25.5</td>
<td>13.8</td>
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<tr>
<td>High tetraplegia (C1–C4) AIS ABC</td>
<td>34.9</td>
<td>21.9</td>
<td>12.4</td>
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<tr>
<td>Ventilator dependent any level</td>
<td>18.7</td>
<td>13.3</td>
<td>7.9</td>
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TOPICS IN SCI Rehabilitation for Primary Care Providers
Accessibility Barriers


TOPICS IN SCI Rehabilitation for Primary Care Providers
Cancer Screenings: SCI vs National Cohort

# Receipt of Preventive Care in the VA System

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<tr>
<th>Service</th>
<th>SCI</th>
<th>non-SCI</th>
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<td>CRC Screening</td>
<td>59</td>
<td>72</td>
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<tr>
<td>Dental Care</td>
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<td>69</td>
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<td>Mammography</td>
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<td>PAP Smear</td>
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Quality of Physical Examinations


TOPICS IN SCI Rehabilitation for Primary Care Providers
SCI and its Systemic Effects

COMPLICATIONS FOLLOWING SPINAL CORD INJURY

TOPICS IN SCI Rehabilitation for Primary Care Providers
Pain in SCI: A Very Nasty Problem

• Between 64 and 88% of people living with SCI have chronic pain

• Between 65 and 78% of people living with SCI have spasticity

• Ameliorating pain is frequently listed as a high health-related priority by people with SCI

Efficacy of Approaches to Pain in SCI

- Mailed survey about approaches to pain by people with SCI
- Insight into perceived efficacy and continuation of a number of medications and therapies

## CanPain Guidelines of 2016

<table>
<thead>
<tr>
<th></th>
<th>First-Line</th>
<th>Second-Line</th>
<th>Third-Line</th>
<th>Fourth-Line</th>
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<tr>
<td>Gabapentinoids</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Amitriptyline</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Tramadol</td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Lamotrigine</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>Transcranial stim</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Transcutaneous stim</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Oxycodone</td>
<td></td>
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## Perceived Efficacy of Medicinal Cannabis (MC)

<table>
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<tr>
<th>Perceived Efficacy</th>
<th>Total (n=129) %</th>
<th>Current Users (n=99)</th>
<th>Past Users (n=30)</th>
<th>Significance X² (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has allowed me to reduce or discontinue other meds?</td>
<td>61.20%</td>
<td>66.70%</td>
<td>43.30%</td>
<td>5.28 (0.032)</td>
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<tr>
<td>Scripts w/ “much worse” effects than MC</td>
<td>37.20%</td>
<td>42.40%</td>
<td>20.0%</td>
<td>4.96 (0.031)</td>
</tr>
<tr>
<td>Scripts w/ “somewhat worse” effects than MC</td>
<td>18.60%</td>
<td>20.20%</td>
<td>13.30%</td>
<td>0.72 (0.593)</td>
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<tr>
<td>MC has greater efficacy than scripts</td>
<td>63.30%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Only MC offered me relief</td>
<td>10.20%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I have suffered symptoms not helped by MC</td>
<td>35.20%</td>
<td>31.60%</td>
<td>46.70%</td>
<td>NS</td>
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Dysautonomia Following SCI

- **Orthostatic Hypotension (OH):**
  - Drop in SPB of $\geq 20$ mm Hg or DBP of $\geq 10$ mm Hg while assuming upright position.
  - Usually symptomatic, **though many people with SCI have low resting BP**
  - Up to 74% of people with cervical and high thoracic SCI experience OH

- **Autonomic Dysreflexia (AD): Medical Emergency**
  - A response to noxious stimulus; usually in people with SCI at T6 or above
  - Cardinal finding is elevation of SBP of at least 20 mm Hg, but also HA, sweating above level of injury, anxiety, blurred vision.
  - 80% of episodes due to urinary or fecal retention

*References*
### Causes of AD

- Bladder
- Bowel
- Pressure Sores
- Tight Clothing
- Fractures
- Ingrown Toenail
- DVT or PE
- Body Positioning
- Invasive Procedures
- Hemorrhoids
- Heterotopic Ossification
- Labor and Delivery
- Menstruation
- Intercourse
- Pain
- Functional Electrical Stimulation

### Symptoms of AD

- Pounding Headache
- Elevated Blood Pressure
- Bradycardia
- Flushing of the skin above level of injury
- Goose Bumps
- Blurred Vision
- Nasal Congestion
- Anxiety
- Could have no other symptoms except elevated BP
## Approaches to Management

<table>
<thead>
<tr>
<th>Orthostatic Hypotension</th>
<th>Autonomic Dysreflexia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institute BP monitoring program (may be ambulatory)</td>
<td>Continuous BP monitoring during episode</td>
</tr>
<tr>
<td>Stockings, binders, slow transition from recumbent to seated positions</td>
<td>Sit upright. Loosen clothing and devices. Assess need for bladder drainage/bowel evacuation</td>
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<tr>
<td>Vasoconstrictor (Midodrine) and/or volume expander (Florinef)</td>
<td>Continue full physical exam</td>
</tr>
<tr>
<td>Consideration of post-prandial hypotension</td>
<td>If BP remains elevated, 0.5 to 1 inch NTP above injury. May also give oral CCB or ACE</td>
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<tr>
<td></td>
<td>If no resolution, refer to emergency department</td>
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</tbody>
</table>
Dysreflexia Takeaway

- Never ignore a headache
- Be a detective—Find the cause
- Usual causes—bladder or bowel
- DEATH
Neurogenic Bowel

NBD results from loss of normal sensory or motor control and may encompass both the upper and the lower gastrointestinal (GI) tract. It is characterized by the inability to control stool. Quality of life is greatly affected; patients often find their symptoms to be socially disabling.

**Upper Motor-Neuron** bowel [Spastic, Reflexive], present at T12 and above. When the bowel becomes full, a BM occurs but in between BMs the anal sphincter stays tight.

**Lower Motor-Neuron** bowel [Flaccid, Non-Reflexive] present below T12-L1. The anal sphincter cannot hold stool in and stool will ooze out.
Bowel Programs

GOALS
- To prevent accidents
- To have a bowel movement at a regular, predictable time.
- In a reasonable amount of time

UMN Program
- Oral Medications
- Digital Stimulation
- Chemical Stimulation

Alternatives
- Colostomy
- Anal Irrigation
- MACE

LMN Programs
- Manual Evacuation
- Maintain Firm Stools

TOPICS IN SCI Rehabilitation for Primary Care Providers
Bowel Takeaway

QOL

Topics in SCI Rehabilitation for Primary Care Providers
Neurogenic Bladder

- Reflexive upper motor neuron injuries T12 and higher - Can’t empty hyper-reflexive
- Areflexic lower motor neuron injuries L1 and lower - Failure to store-flaccid bladder

Management

- Foley Catheter
- Intermittent Catheterization
- Medications
- Suprapubic Catheter
- Condom Catheter
- Mitrofanoff
Bladder Takeaways

- **Bladder management**
  - Individualized based on hand function, caregiver assistance, body habitus, gender, etc.
  - Intermittent catheterization often considered optimal

- **Surveillance**
  - Urinalysis and culture not recommended
  - Consider annual renal assessment

- **UTI**
  - Treatment with antibiotics should be based upon culture sensitivities
  - Only treat symptomatic UTI’s (cloudy and malodorous urine without other symptoms is not considered a UTI)
Preventive Health after SCI

- **Immunization**
  - Annual influenza
  - Pneumococcal vaccination (important addition to SCI group)

- **Lifestyle**
  - Inquire about smoking or vaping
  - Inquire about alcohol and drug use

- **Exercise: Cardiorespiratory**
  - 20 minutes of moderate/vigorous intensity aerobic exercise twice per week
  - Three sets of strength exercises for each major functioning muscle group twice per week

- **Cardiometabolic benefits**
  - 30 minutes for moderate to vigorous intensity aerobic exercise three times a week
Preventative Health after SCI

- Obesity is common
  - BMI > 22 as cut off

- Nutrition
  - Require fewer calories
  - Mediterranean plan

- Dyslipidemia and Glucose metabolism
  - Initial screen, repeat every 3 years

- Hypertension
  - B/P at every routine visit

CLINICAL PRACTICE GUIDELINES: SPINAL CORD MEDICINE

Identification and Management of Cardiometabolic Risk after Spinal Cord Injury

Clinical Practice Guideline for Health Care Providers

pva.org/cpg • ParalyzedVeterans • PVA1946

TOPICS IN SCI Rehabilitation for Primary Care Providers
Resources for Primary Care
Currently available

https://actionnuggets.ca/

https://scireproject.com/clinical-resources/health-care-providers/

TOPICS IN SCI Rehabilitation for Primary Care Providers
ASIA Primary Care Committee:

- Primary care clinicians, SCI specialists, consumers with SCI, researchers, and other SCI stakeholders
- Dialogue amongst these groups (and others as needed) with the goal of advancing primary care delivery and services for people with SCI
- Open access online special edition for PCP’s and others
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>CONTENT AUTHOR</th>
<th>PCP AUTHOR</th>
<th>CONSUMER AUTHOR</th>
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<tr>
<td>Behavioral Health/ Depression</td>
<td>Chuck Bombardier PhD</td>
<td>Sean Hurst MD, Dan Muldoon MD</td>
<td>Erik Hjiltnes</td>
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<td>Bladder and UTI</td>
<td>Mike Kennelly MD</td>
<td>James Milligan MD, Lance Goetz MD</td>
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<td>Bone Health</td>
<td>Cristina Sadowsky MD, Nina Mingioni MD</td>
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<td>Joseph Zinski PhD</td>
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<td>Lance Goetz MD</td>
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<td>Rachel Cowan</td>
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<td>Dysautonomia</td>
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<td>Rose Brooks PT, Joe Lee MD</td>
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<td>Michelle Melicosta MD</td>
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<td>Jeremy Milligan MD</td>
<td>Jeremy Howcroft</td>
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<td>Pulmonary Complications</td>
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<td>Brandon Menachem MD</td>
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<td>Shoulder/UE</td>
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<td>David Gater MD, PhD, Michael Stillman MD, Sav Babapoor MD</td>
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The two North American organizations serving SCI professional have partnered with primary care clinicians to develop current and easy to use clinical updates on commonly encountered health conditions among people with SCI.

**Vascular Disease**

Describes what is and is not known about the cardiovascular disease and glycemic dysregulation that frequently attend SCI.

**Preventative Health**

Raise awareness and provide guidance for preventive health and health maintenance after spinal cord injury (SCI) for primary care providers (PCP).

**Bowel**

This article describes elements for a neurogenic bowel program, and will review recommendations regarding the clinical management of neurogenic bowel.

**Sexuality**

This article provides information & key clinical concepts regarding the management of functional bowel disorders.
Concluding Remarks

- People with SCI are “high utilizers” of health care, but have poorer health outcomes. How can we address that?
- SCI specialists are available, but we hope to improve PCP awareness of common secondary effects of SCI.
- We know that 30 years after passage of the ADA, health care is still largely inaccessible to people with SCI. What can we do about that?
- Discussion?