Academy of Spinal Cord Injury Professionals, Inc.™

Many Minds. One Vision.

ASIA

AMERICAN SPINAL INJURY ASSOCIATION

TOPICS IN
SCI Rehabilitation for Primary Care Providers

Proposal Number (pC ID): 632635 • Award Number: 632635

FUNDED BY

CRAIG·H NEILSEN FOUNDATION

Academy of Spinal Cord Injury Professionals, Inc.™
Many Minds. One Vision.

ASIA
American Spinal Injury Association

MEMBERS OF THE Primary Care Committee

Suzanne L. Groah MD, MSPH – Co-Chair
MedStar National Rehabilitation Hospital
Washington, DC

Lisa Beck MS, APRN, CNS, CRRN – Co-Chair
Mayo Clinic
Rochester, MN

Kim Anderson PhD
Case Western Reserve University
Cleveland, OH

Jeff Berliner DO
Craig Hospital
Englewood, CO

Robin Bischoff, CRRN
Kessler Institute for Rehabilitation
West Orange, New Jersey

Phillipines Cabahug MD
Kennedy Krieger Institute
Baltimore, MD

Michelle Gittler, MD
Schwab Rehabilitation Hospital/
Sinai Health System
Chicago, IL

Erin Hall, MD
MedStar Health
Washington, DC

Kristi Henzel MD PhD
Case Western Reserve University/
Louis Stokes Cleveland VA Medical Center
Cleveland, OH

Suzy Kim MD
Rancho Los Amigos Natl.
Rehabilitation Center
San Clemente, CA

Indira Lanig, MD
Paradigm
Denver, CO

James Milligan MD CCFP
Centre for Family Medicine
Kitchener-Waterloo, Ontario, Canada

Maureen Miner MD
South County Pain and Rehab.
Morgan Hill

Maria Reyes MD
University of Washington
Seattle, WA

Heather Russell PhD
Shriners Hospital for Children
Philadelphia, PA

Christina Sadowsky MD
Kennedy Krieger Institute and
Johns Hopkins School of Medicine
Baltimore, MD

Christopher Shamatutu BSC
University of British Columbia
Vancouver, Canada

Chloe Slocum MD
Harvard Medical School /
Spaulding Rehabilitation Hospital /
VA Boston Healthcare
Brookline, MA

Sara Spinner-Block MD

Michael Stillman, MD
Thomas Jefferson University
Philadelphia, PA

John Tscida, MPP
Association of University Centers
on Disabilities
Washington, DC

Cody Unser

Steve Williams, MD
Thomas Jefferson University
Philadelphia, PA

Dan Muldoons MD

Lindsay Donaldson
Centre for Family Medicine Family Health
Kitchener-Waterloo, Ontario, Canada

Academy of Spinal Cord Injury Professionals, Inc.™
Many Minds. One Vision.

ASIA
American Spinal Injury Association

Primary Care for Persons with Spinal Cord Injury or Disease

Robin Bischoff, CRRN Kessler Institute for Rehabilitation

rbischoff@kessler-rehab.com

Michael Stillman, MD Sidney Kimmel Medical College of Thomas Jefferson University

michael.stillman@jefferson.edu

TOPICS IN SCI Rehabilitation for Primary Care Providers

Conflicts and Disclosures

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

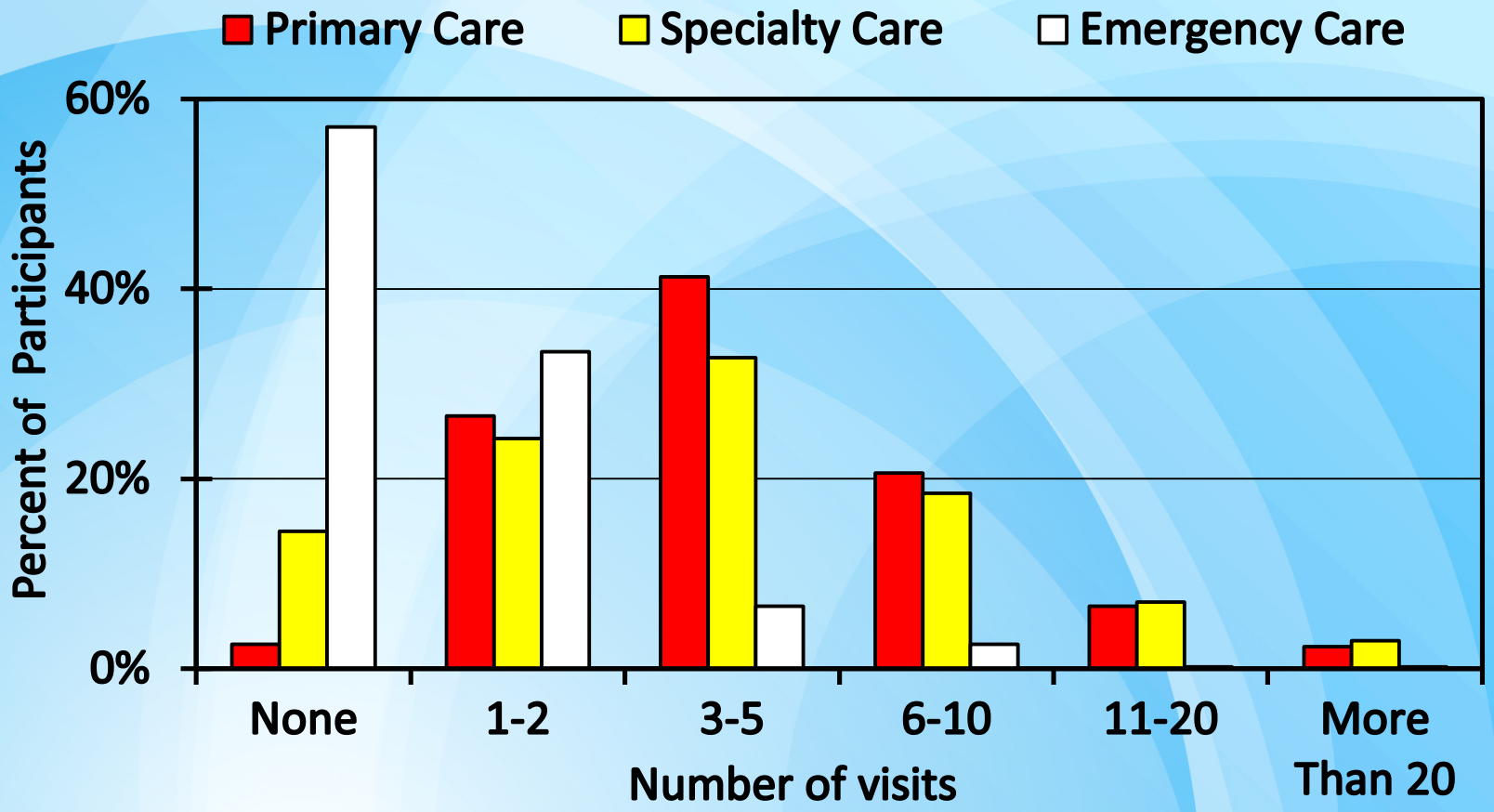
4) A call to action and advocacy

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%

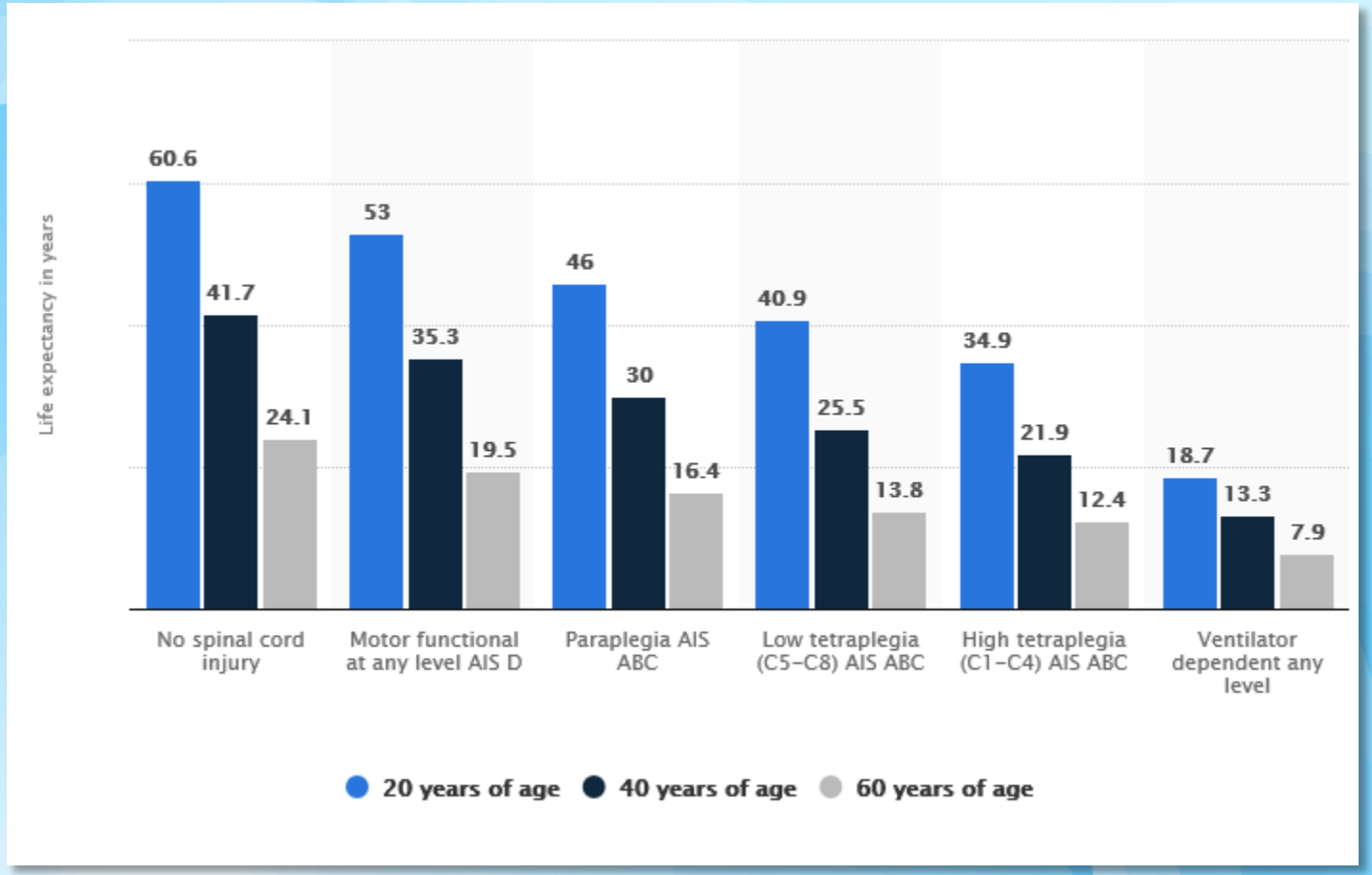
National Spinal Cord Injury Statistical Center "Spinal Cord Injury Facts and Figures at a Glance 2019"
http:nscisc.uab.edu/Public/Facts%20and%20Figures%202019%20-%20Final.pdf

Health Care Utilization



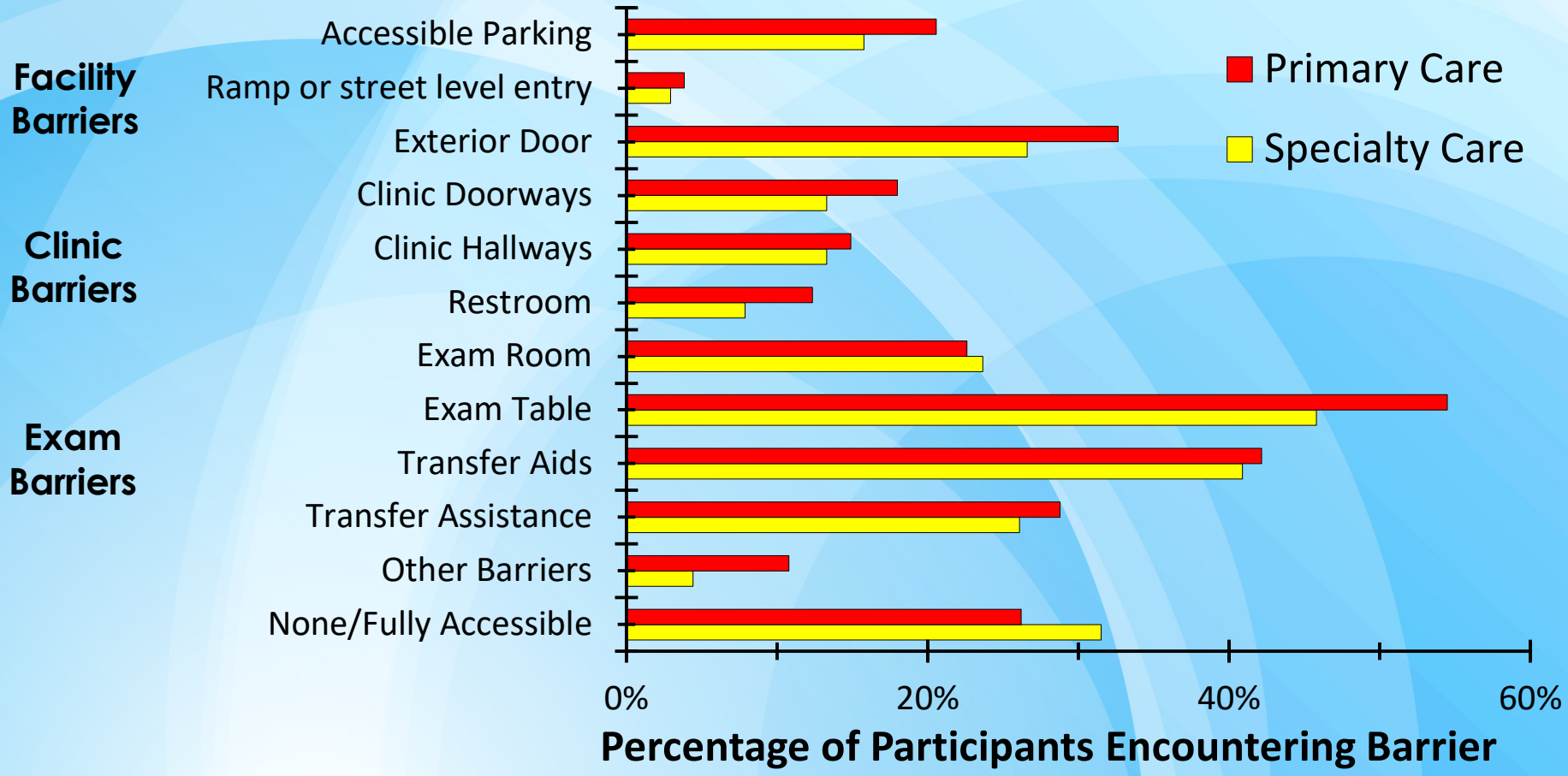
Stillman et al. Health care utilization and associated barriers experienced by wheelchair users: A pilot study. Disabil Health J. 2017; 10(4):502-8.

Life Expectancy in SCI



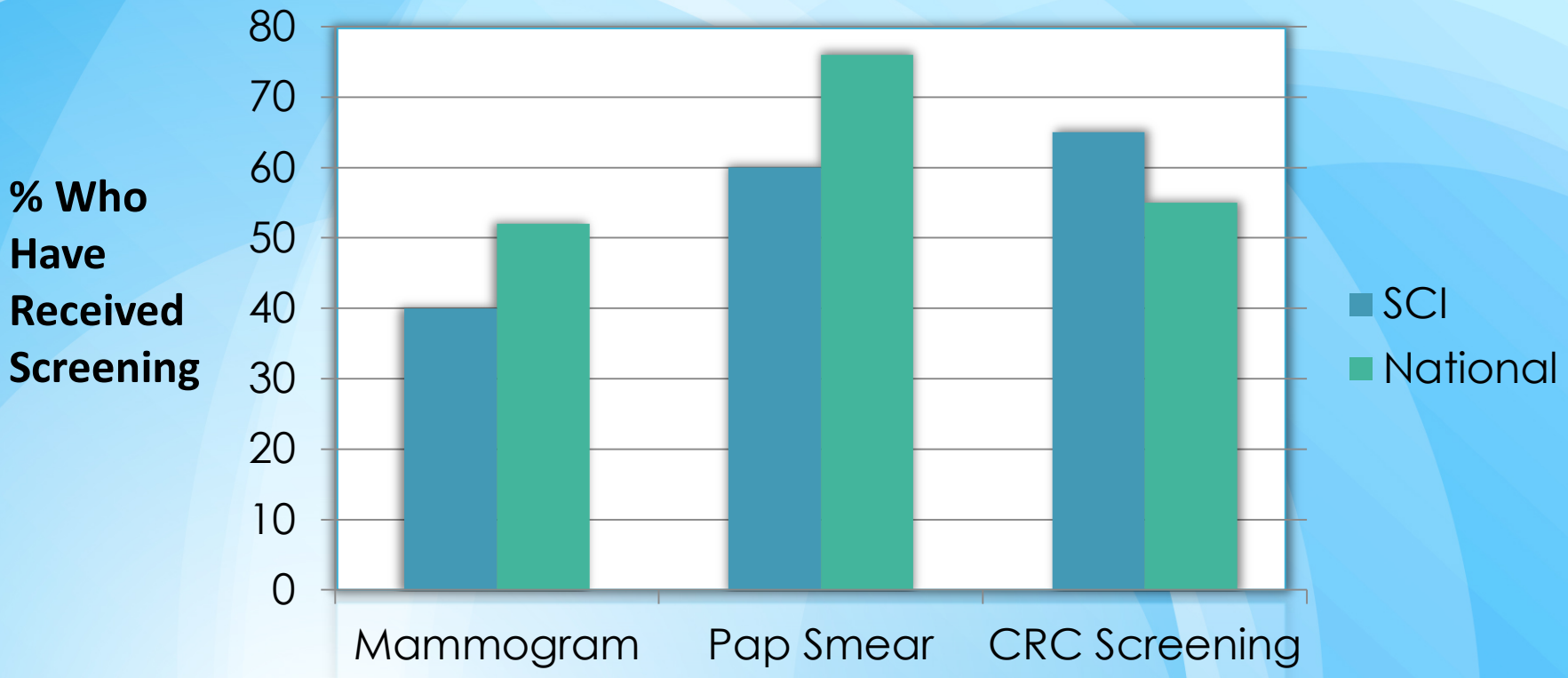
Life expectancy for spinal cord injuries in the U.S. for those who survive at least one year post-injury as of 2018, by age and severity.
https://www.statsta.com/statistics/640901/life-expectancy-spinal-cord-injuries-persons-who-survive-one-year/

Accessibility Barriers



Stillman et al. Health care utilization and associated barriers experienced by wheelchair users: A pilot study. Disabil Health J. 2017; 10(4):502-8.

Cancer Screenings: SCI vs National Cohort



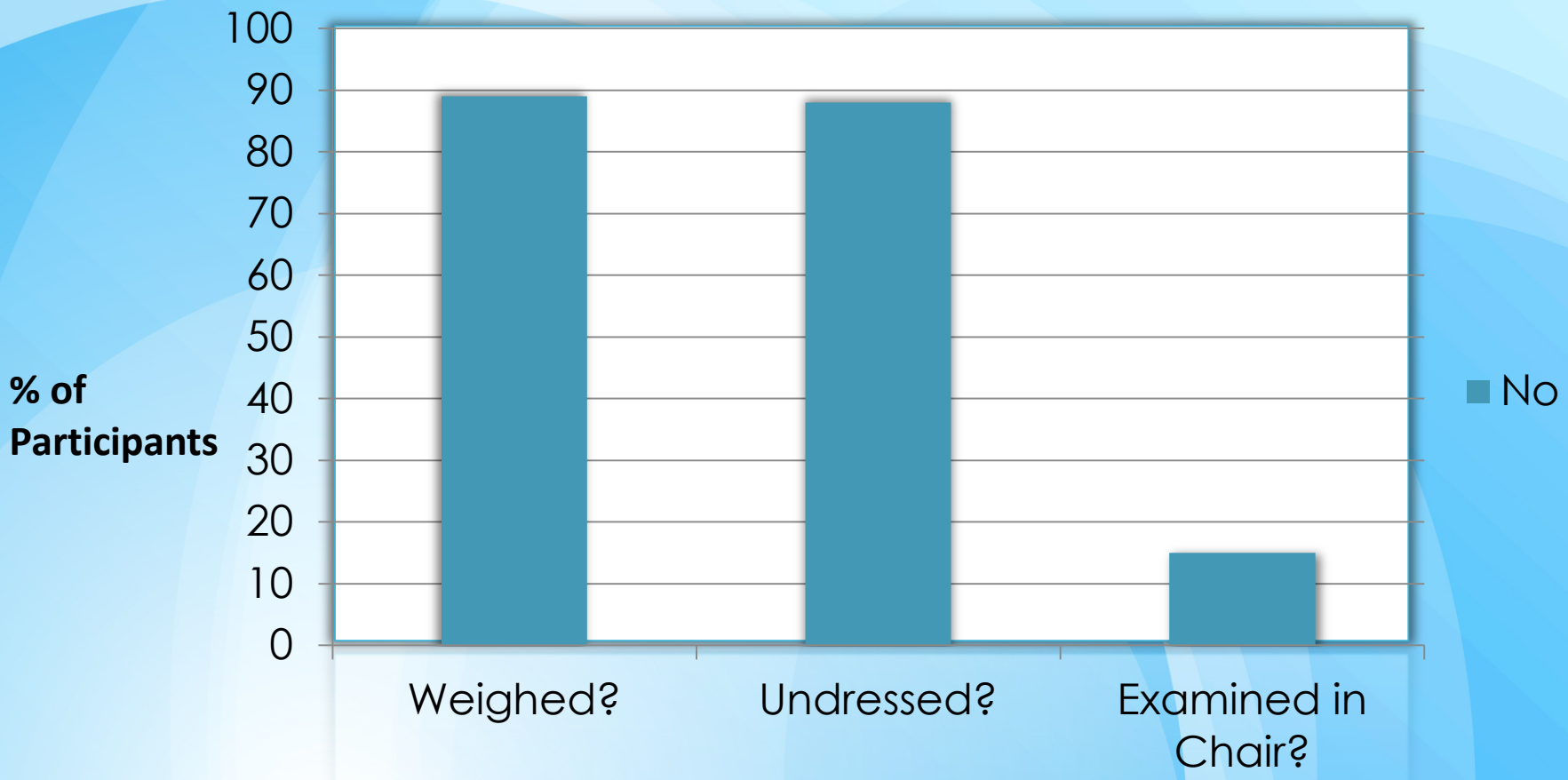
Stillman et al. Health care utilization and barriers experienced by individuals with spinal cord injury. Arch Phys Med Rehabil. 2014;95(6):1114-26.

Receipt of Preventive Care in the VA System

	SCI	non-SCI
CRC Screening	59	72
Dental Care	56	69
Mammography	84	91
PAP Smear	88	98

LaVela et al. Disease prevalence and use of preventive services: comparison of female veterans in general and those with spinal cord injuries and disorders. J Womens Health. 2006;15(3):301-11.

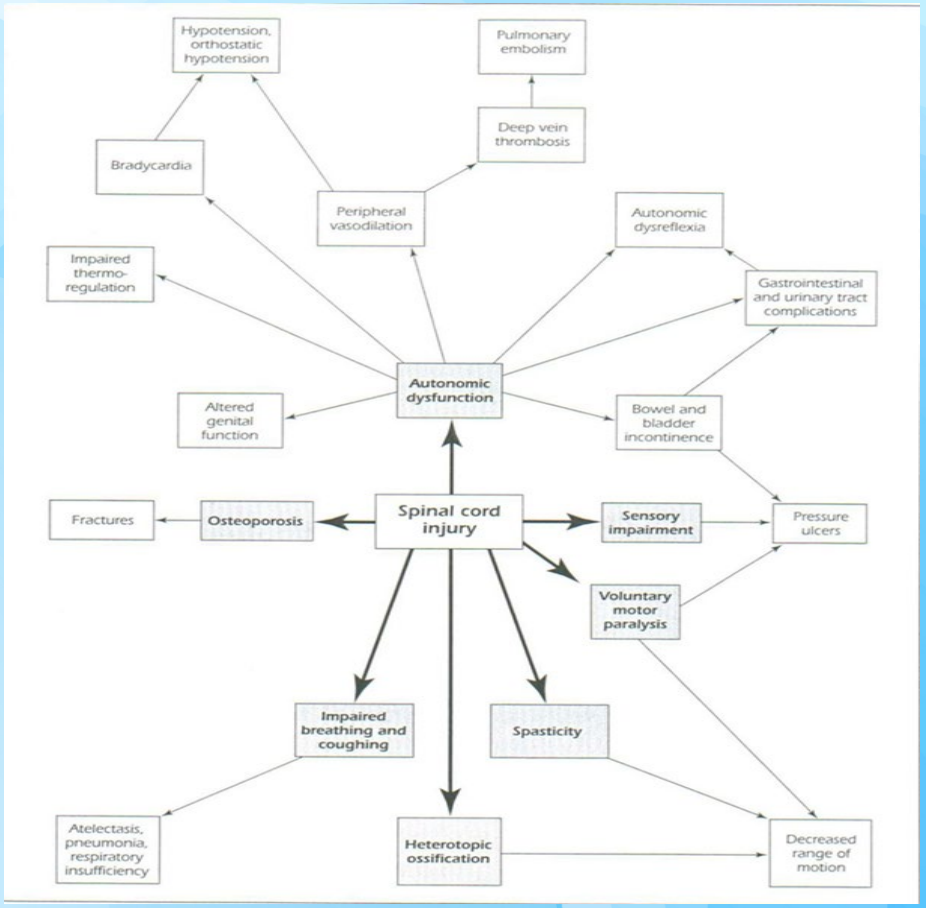
Quality of Physical Examinations



Stillman et al. Health care utilization and barriers experienced by individuals with spinal cord injury. Arch Phys Med Rehabil. 2014;95(6):1114-26.

SCI and its Systemic Effects

COMPLICATIONS FOLLOWING SPINAL CORD INJURY



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

Adriaansen et al. Secondary health conditions and quality of life in persons living with spinal cord injury for at least 10 years. J Rehabil Med. 2016;48:853-60
Ataoglu et al. Effects of chronic pain on quality of life and depression in patients with spinal cord injury. Spinal Cord. 2013;51:23-26.
Anderson KD. Targeting recovery: priorities of the spinal cord-injured population. J Neurotrauma. 2004;21(10):1371-83.

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

Cardenas et al. Treatments for Chronic Pain in Persons with Spinal Cord Injury: A Survey Study. J Spinal Cord Med. 2016;29(2): 109-117.

CanPain Guidelines of 2016

	First-Line	Second-Line	Third-Line	Fourth-Line
Gabapentinoids	X			
Amitriptyline	X			
Tramadol		X		
Lamotrigine		X		
Transcranial stim			X	
Transcutaneous stim				X
Oxycodone				X

Guy et al. The CanPan SCI Clinical Practice Guidelines for Rehabilitation Management of Neuropathic Pain after Spinal Cord Injury: Recommendations for Treatment. Spinal Cord (2016) 54, S14-23.

Perceived Efficacy of Medicinal Cannabis (MC)

Perceived Efficacy	Total (n=129) %	Current Users (n=99)	Past Users (n=30)	Significance X^2 (p)
Has allowed me to reduce or discontinue other meds?	61.20%	66.70%	43.30%	5.28(0.032)
Scripts w/ "much worse" effects than MC	37.20%	42.40%	20.0%	4.96(0.031)
Scripts w/ "somewhat worse" effects than MC	18.60%	20.20%	13.30%	0.72(0.593)
MC has greater efficacy than scripts	63.30%			
Only MC offered me relief	10.20%			
I have suffered symptoms not helped by MC	35.20%	31.60%	46.70%	NS

Dysautonomia Following SCI

- **Orthostatic Hypotension (OH):**

-Drop in SPB of ≥ 20 mm Hg or DBP of ≥ 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

-Faaborg et al. Autonomic dysreflexia during bowel evacuation procedures and bladder filling in subjects with spinal cord injury. Spinal Cord. 2014;52:494-98.
-Krassioukov et al. International standards to document remaining autonomic function after spinal cord injury. Top Spinal Cord Inj Rehabil. 2012;18:282-96.
-Claydon et al. Orthostatic hypotension and autonomic pathways after spinal cord injury. J Neurotrauma. 2006;23:1713-25.

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

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

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

Bowel Takeaway

QOL

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

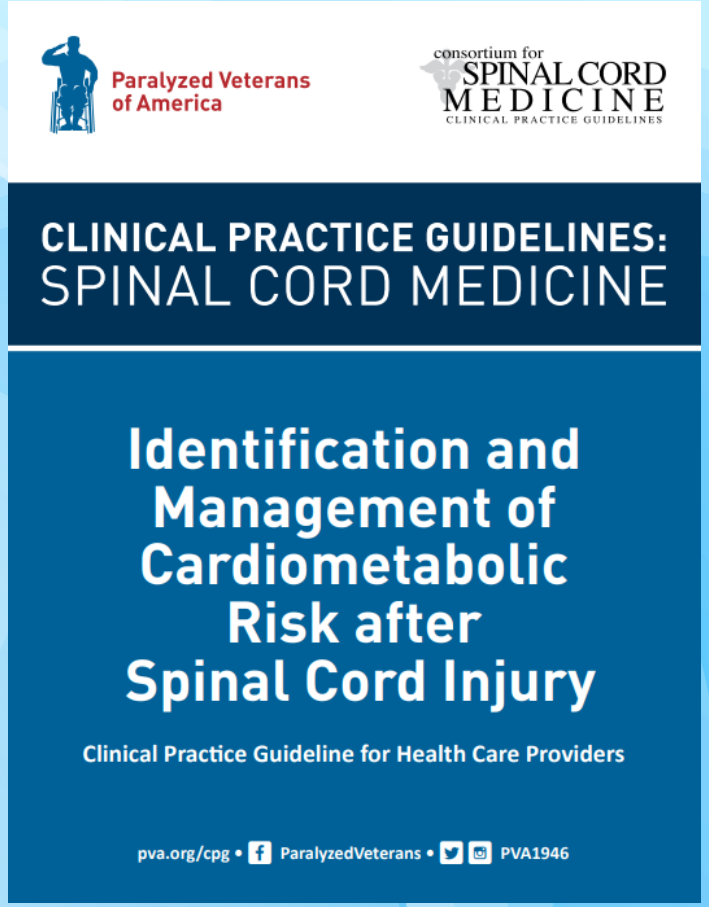
- Bladder management
  - Individualized based on hand function, caregiver assistance, body habitus, gender, etc.
  - Intermittent catheterization often considered optimal
- Surveillance
  - Urinalysis and culture not recommended
  - Consider annual renal assessment
- UTI
  - Treatment with antibiotics 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

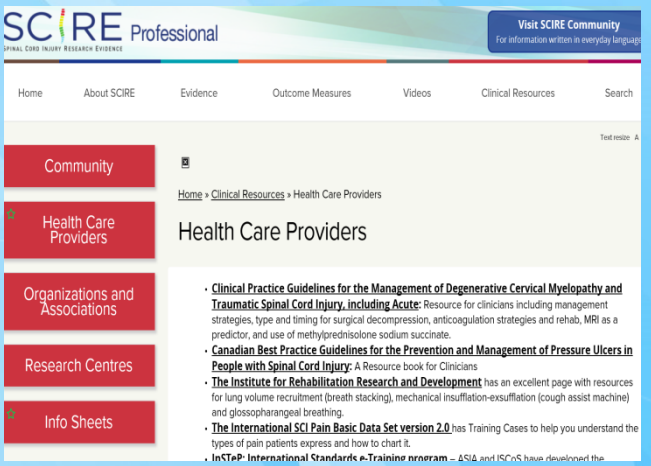


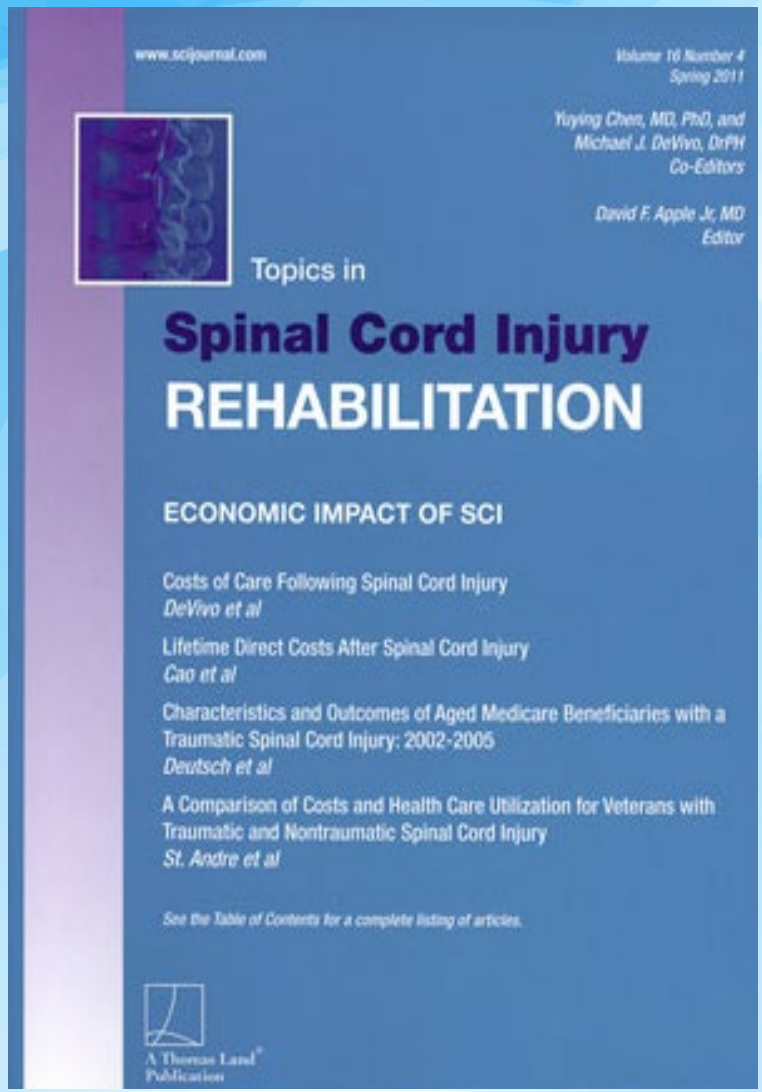
Resources for Primary Care

Currently available

- https://actionnuggets.ca/

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





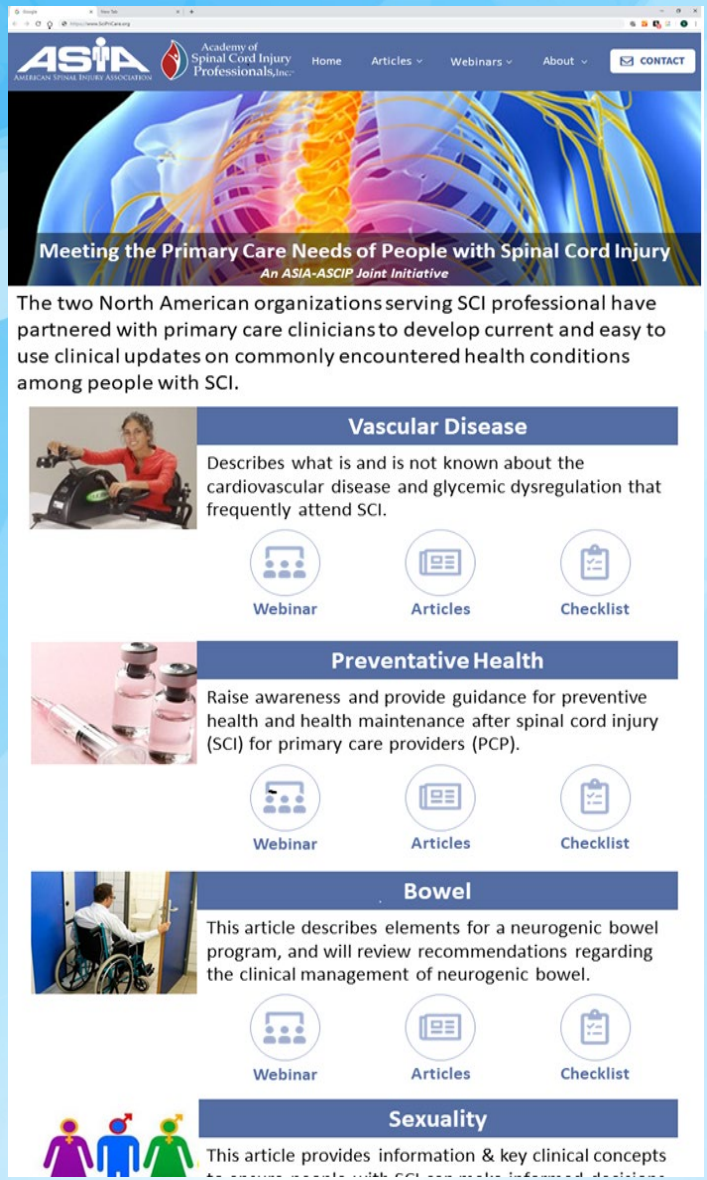
ASIA Primary Care Committee:

- 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

TOPICS IN SCI REHABILITATION PRIMARY CARE SPECIAL EDITION

Co-Editor: Suzanne Groah, MD, MSPH
Co-Editor: Lisa Beck MS, APRN, CNS

TOPIC	CONTENT AUTHOR	PCP AUTHOR	CONSUMER AUTHOR
Behavioral Health/ Depression	Chuck Bombardier PhD	Sean Hurt MD Dan Muldoon MD	Erik Hjltnes
Bladder and UTI	Mike Kennelly MD	James Milligan MD	Lance Goetz MD
Bone Health	Cristina Sadowsky MD	Nina Mingioni MD	Joseph Zinski PhD
Bowel	Wilda Montero DNP, FNP	Michael Stillman MD, Phil Durney MD	Lance Goetz MD
Diet and Nutrition	David Gater MD, PhD	Craig Bauman	Rachel Cowan
Dysautonomia	Andrei Krassioukov MD	Michael Stillman MD	Jesse Lieberman MD
Needs/Barriers/ Accessibility	Rose Brooks PT	Joe Lee MD	Ben Turpen
Nutrition and Exercise	David Gater MD, PhD		Rachel Cowan
Pain	Eva Widerstrom-Noga PhD	Upe Mehan MD	Kim Anderson PhD
Peds	Kathy Zebracki MD, Larry Vogel MD	Michelle Melicosta MD	Cody Unser
Preventative Health	Stephen Burns MD, Suzanne Groah MD	Jeremy Milligan MD	Jeremy Howcroft
Pulmonary Complications	Rina Reyes MD, Maryjo Elmo CNP	Brandon Menachem MD	Sara Granda
Rehab Needs/DME	Erin Michael DPT	Ternin Sytsma MD	Rachel Cowan PhD
Sexual Health	Sigmund Hough PhD	Jithin Varghese MD	Jesse Lieberman MD, Lance Goetz MD, Angela Keummel PhD
Shoulder/UE	Sara Mulroy PT, PhD	Luke Hafdahl MD	Trevor Dyson-Hudson MD
Skin	Kristi Henzel MD	Nicole Rosin CNP	John Trimbath
Social Justice	Angela Kuemmel PhD, Anne Bryden PhD		Josh Basile Kelley Simoneaux
Spasticity	Pine Cabahug MD, Travis Edmiston MD	Charles Pickard MD	Jesse Lieberman MD
Vascular Disease and Glycemic Dysregulation	David Gater MD, PhD	Michael Stillman MD, Sav Babapoor MD	Ron Goldberg MD
Womens Health	Chloe Slocum MD	Molly Halloran MD	Cody Unser



ASCIP/ASIA Future Resources

- Joint website page
  - ASIA and ASCIP
- Open access of Topics journal articles
- Video record workshop
- Develop webinar

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?

TOPICS IN **SCI Rehabilitation for Primary Care Providers**

TOPICS IN **SCI Rehabilitation for Primary Care Providers**