Supporting People Living With Spinal Cord Injury, Traumatic Brain Injury, and Burn Injury

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Location:
A webinar for National Information and Referral Support Center, ADvancing States
Agenda

1. Introduction

2. Spinal cord injury (SCI)

3. Traumatic brain injury (TBI)

4. Burn injury

5. SCI, TBI, and burn injury resources from the Model Systems Knowledge Translation Center (MSTKC)

6. Q & A
Who We Are

Phillip Klebine, MA
Knowledge Translation Director, University of Alabama at Birmingham Spinal Cord Injury Model System and National Spinal Cord Injury Statistical Center
Who We Are

Tamara Bushnik, PhD
Principal Investigator, Rusk Rehabilitation Traumatic Brain Injury Model System
Who We Are

Gretchen Carrougher, MN, RN
Program Coordinator,
Northwest Regional Burn Model System
Research Nurse Supervisor, UW Medicine Regional Burn Center
Who We Are

Xinsheng “Cindy” Cai, PhD
Principal Investigator and Project Director, Model Systems Knowledge Translation Center
Who We Are

Victoria Lennon, BA
Senior Communication Specialist, Model Systems Knowledge Translation Center
Who We Are

• Model Systems (https://msktc.org/about-model-systems)
  a. Improve care and outcomes for people living with SCI, TBI, and burn
  b. Provide a multidisciplinary system of rehabilitation care, including emergency medical, acute medical, and post-acute services
  c. Build national capacity for high-quality treatment and research serving people with SCI, TBI, and burn injury, their families, and the communities in which they reside
  d. Conduct research to develop interventions, measurements, medications, and clinical practice guidelines to support people living with SCI, TBI, and burn injury
Who We Are

• Model Systems Knowledge Translation Center (MSKTC; www.msktc.org)
  a. Works with Model System researchers to develop and disseminate free, research-based resources to support people living with SCI, TBI, and burn injury

• Both Model Systems and MSKTC are funded by the National Institute on Disability, Independent Living, and Rehabilitation Research, Administration for Community Living, U.S. Department of Health and Human Services
People Living With SCI, TBI, and Burn in the U.S.

- 294,000 people in the U.S. live with SCI, and there are 17,900 new SCI cases per year.¹

- 2.9 million people visit an emergency department, are hospitalized, or die as a result of a TBI each year.²

- 486,000 people receive medical treatment for burn injuries and 40,000 burn injuries require hospitalization each year.³

A Poll

1. How many of you have worked with or known someone living with an SCI, TBI, or burn injury?
Support People Living With Spinal Cord Injury
Demographics

1. Age at injury—The average age at injury has increased from 29 years during the 1970s to 43 since 2015.
2. Sex—About 78% of new SCI cases since 2015 are male.
3. Race/ethnicity—Recently, about 24% of injuries have occurred among non-Hispanic Blacks, which is higher than the proportion of non-Hispanic Blacks in the general population (13%).

Demographics (Continued)

1. Lengths of stay—Lengths of stay in the hospital acute care unit have declined from 24 days in the 1970s to 11 days recently. Rehabilitation lengths of stay have also declined from 98 days in the 1970s to 30 days recently.

2. Neurological level and extent of lesion

What Is a Spinal Cord Injury?

• An SCI is damage to the spinal cord or the spinal nerve roots (cauda equina) within the spinal canal that results in temporary or permanent loss of movement and/or sensation.
  – Traumatic
  – Nontraumatic
The International Standards for Neurological Classification of SCI

- The International Standards for Neurological Classification of SCI exam, also known as the ASIA Impairment Scale (AIS), defines the extent of an SCI
  - Level of injury
  - Complete vs. incomplete

- ASIA Score
Nervous System

- Central nervous system
- Peripheral nervous system
- Controls the body’s three essential functions:
  1. Motor functions
  2. Sensory functions
  3. Autonomic functions
Sectional Spine and Spinal Cord Nerve Functions

Motor (muscle movement)
- C1: Neck
- C2: Shoulders
- C3: Biceps
- C4: Brachioradialis
- C5: Triceps
- C8: Fingers & Hands
- T1: Respiratory
- T2: Abdomen
- T3: Hips
- T4: Groin & Scrotum
- T5: Legs
- T6: Feet & Toes
- T7: Buttock & Anus
- T8: Integumentary
- T9: Reflex Sexual Response
- T10: Sensory Sexual Response
- T11: Autonomic Sexual Response
- T12: S1: Buttock
- L1: S2: Groin
- L2: S3: Integumentary
- L3: S4: Reflex Sexual Response
- L4: S5: Bowel & Bladder
- L5: Coccygeal Nerve

Sensory (sensation of touch)
- C1: Neck & Scalp
- C2: Shoulders
- C3: Biceps
- C4: Triceps
- C5: Fingers & Hands
- T1: Fingers & Hands
- T2: T2
- T3: T3
- T4: T4
- T5: T5
- T6: T6
- T7: T7
- T8: T8
- T9: T9
- T10: T10
- T11: T11
- T12: T12
- L1: L1
- L2: L2
- L3: L3
- L4: L4
- L5: L5
- Coc: Coccygeal Nerve

Autonomic (involuntary actions)
- C1: Temperature Regulation & Blood Pressure
- C2: Psychogenic Sexual Response
- C3: Reflex Sexual Response
- C4: Bowel & Bladder
- C5: S1
- C6: S2
- C7: S3
- C8: S4
- T1: S5
- T2: Coc

Diagram Created by the UAB Spinal Cord Injury Model System
Managing Bowel Function Video

1. MSKTC video: Family Dynamics and Resilience | Model Systems Knowledge Translation Center (MSKTC)
Secondary Medical Complications

1. Pressure injury
2. Respiratory function
3. Urinary tract infection
4. Autonomic dysreflexia (T6 ↑)
5. Bowel function
6. Bladder function
7. Depression
8. Pain
9. Sexual function (men)
10. Spasticity
Psychosocial

1. Adjustment
2. Driving
3. Employment/school
4. Physical activity
5. Personal care attendant
6. Sexuality
Support People Living With Traumatic Brain Injury
TBI is defined as **damage to brain tissue** caused by an external mechanical force as evidenced by **medically documented loss of consciousness** or post traumatic amnesia (**PTA**) due to brain trauma or by **objective neurological findings** that can be reasonably attributed to TBI on physical examination or mental status examination.
Age

mean = 43.38; n = 18,550

Gender

- Male: 74%
- Female: 26%

\[ n = 18,542 \]

Race and Ethnicity

- White: 66%
- Black: 18%
- Hispanic: 11%
- Asian: 3%
- Others: 2%

$n = 18,543$

Level of Education At Injury

- High School/GED: 35%
- Some College: 23%
- High School: 25%
- >=Bachelors: 17%


\( n = 18,254 \)
Causes of Injury

- Vehicular: 49%
- Falls: 29%
- Violence: 11%
- Other: 11%

$n = 18,509$

Duration of PTA

mean = 22.32 days; n = 14,454

Functional Independence Measure® Instrument

Mean scores converted to 7-point scale

- Complete independence
- Modified independence
- Supervision
- Minimal assistance
- Moderate assistance
- Maximal assistance
- Total assistance

Residence

Employment Status

Common Issues for People Living With TBI

- **Cognitive issues**
  - Poor concentration
  - Memory problems
  - Poor judgment and impulsivity
  - Slowed processing of ideas
  - Difficulty planning

- **Physical issues**
  - Fatigue
  - Dizziness
  - Headache
  - Trouble sleeping
Videos on Memory Loss After TBI

• Emotional Impact of Memory Loss: https://msktc.org/tbi/Hot-Topics/Memory/Emotional_Impact_Memory
Supporting People Living With Burn Injury
What Defines a Burn Injury?

1. Causes of injury include:
   a. Flame or flash
   b. Scalding liquids
   c. Electrical
   d. Chemical
   e. Contact
   f. Radiation
   g. Friction

2. Accidental or intentional
What Does It Mean to Have a Burn Injury?
Understanding Burn Injury

- Demographics of injury
- Injury severity depends on many factors
- Individualized response
- Fearful of outcome
Injury Demographics

The American Burn Association (ABA) maintains a national database of burn injuries. This ABA National Burn Repository (NBR) report represents 10 years of cumulative data, 2009–2018, from 101 U.S. burn centers, including 69 ABA-verified burn centers, four Canadian, two Swedish, and one Swiss burn center.

Injury Demographics by Etiology—NBR Data

Total N=202,807 (Excluding 18,712 Unknown/Missing)

Injury Demographics by Race—NBR Data


Total N = 213,811 (Excluding 7,708 Unknown/Missing)
Injury Demographics by Place of Injury—NBR Data

Total N = 196,519 (Excluding 25,000 Unknown/Missing)

Injury Severity

- Size, depth, and location of injury
- Age
- Comorbidities and preexisting health
- Requires a knowledgeable clinician for complete evaluation

American Burn Association Advanced Burn Life Support
People Living With Burn Injury
Common Issues Living With Burn Injury

**I did go into a big deep depression for about 6 to 8 months. I didn't leave the house...**

**A minor burn happens to someone else!**

**Itching -- I was burned over 32 years ago and itching is an ongoing daily reality!**

**I live with physical limitations everyday - It can be tough going!**

**I live 3 hours away (from my burn center) - I felt like I needed to advocate for PT and OT after discharge.**

**Can I work again?**
Words From Ben—Burn Survivor
MSTKC Resources to Support People Living With SCI, TBI, and Burn Injury
MSKTC Resources

• Free and research-based

• User friendly

• In multiple formats, e.g., factsheets, infocomics, videos, narrated slideshows

• Focus on a wide range of rehabilitation topics
  • 24 SCI rehabilitation topics
  • 27 TBI rehabilitation topics
  • 20 burn injury rehabilitation topics
MSKTC Website Tour (https://msktc.org/)

Spinal Cord Injury
msktc.org/sci

Traumatic Brain Injury
msktc.org/tbi

Burn Injury
msktc.org/burn
Other SCI Resources

• Christopher and Dana Reeve Foundation: https://www.christopherreeve.org/

• FacingDisability: https://facingdisability.com/

• Paralyzed Veterans of America: http://www.pva.org/

• United Spinal Association: http://www.unitedspinal.org/

• Primary Care Provider Resource for SCI https://www.uab.edu/medicine/pcp-sci/pcp-resource
Other TBI Resources

• Brain Injury Association of America: http://www.biausa.org/

• BrainLine: https://www.brainline.org/

• National Association of State Head Injury Administrators: https://www.nashia.org/

• United States Brain Injury Alliance: https://usbia.org/
Other Burn Resources

• American Burn Association: https://ameriburn.org/

• Phoenix Society for Burn Survivors: https://www.phoenix-society.org/
Q & A
Contact Information

For more information, please contact us at: MSKTC@air.org.
Thank you!

The contents of this presentation were developed under a grant from the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR grant number 90DPKT0009). NIDILRR is a Center within the Administration for Community Living (ACL), Department of Health and Human Services (HHS). The contents of this presentation do not necessarily represent the policy of NIDILRR, ACL, HHS, and you should not assume endorsement by the Federal Government.