



Thank you for joining us!

The presentation will begin shortly.



Defining Model Systems:
Maximizing Outcomes Following
Spinal Cord & Brain Injuries

THANK YOU FOR JOINING US!



Moderators:

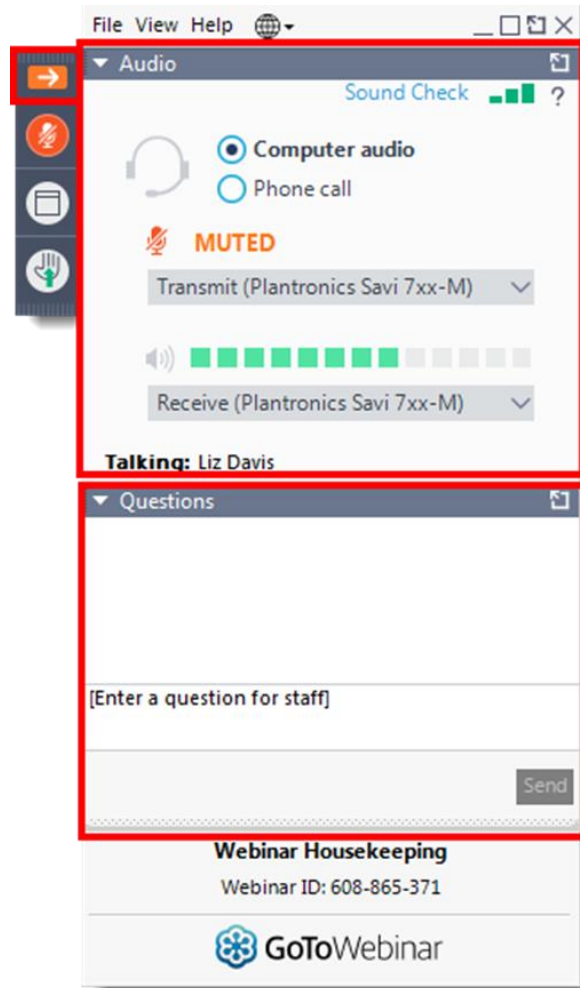


Lisa Strader
Medical Manager,
Safety National



Stacy Whalen
Senior Medical Manager,
Safety National

WEBINAR HOUSEKEEPING



Your Participation

Open and close your control panel.

Join audio:

- Choose **Mic & Speakers** to use VoIP.
- Choose **Telephone** and dial using the information provided.

Submit questions and comments via the Questions panel.

Note: Today's presentation is being recorded and will be provided within 48 hours.

THE EXPERTS



Dr. Jeff Berliner, D.O.
Medical Director of
Spinal Cord Research,
Craig Hospital



Dave Mellick, Ph.D.
Director of Research
Operations,
Craig Hospital

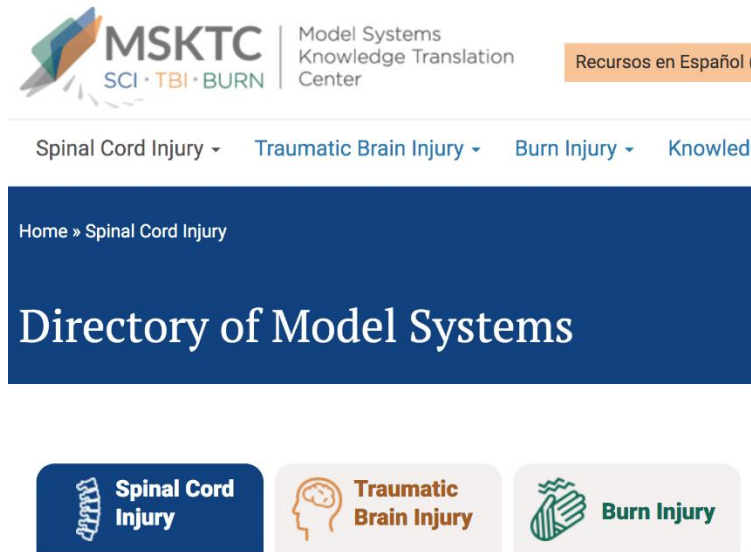
PRESENTATION OVERVIEW



What are the Model Systems?

There are currently three Model Systems programs:

- The SCIMS program was established in 1970.
- The TBIMS program was established in 1987.
- The Burn Model Systems program was established in 1994.



Source: <https://msktc.org/sci/model-system-centers>

WHAT IS A MODEL SYSTEM?



Model Systems, sponsored by the **National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR)**, Administration for Community Living, and the U.S. Department of Health and Human Services, supports innovative projects and research in the delivery, demonstration, and evaluation of medical, rehabilitation, vocational and other services to meet the needs of individuals with either a traumatic brain injury, spinal cord injury or burn.

NIDILRR awards grants to institutions that are **national leaders** in medical **research** and **patient care** and provide the highest level of **comprehensive specialty services**, from the point of injury through rehabilitation and reentry into full community life.

Each Model Systems Center contributes to the Model Systems Data Center, participates in independent and collaborative research, and provides information and resources to individuals with injury, their family and caregivers, health care professionals and the general public.

WHAT IS A MODEL SYSTEM?



Model Systems are funded in five-year cycles

Specialized system of care that consists of:

- Acute care partners (trauma centers)
- Multidisciplinary rehabilitation
- Long-term follow-up

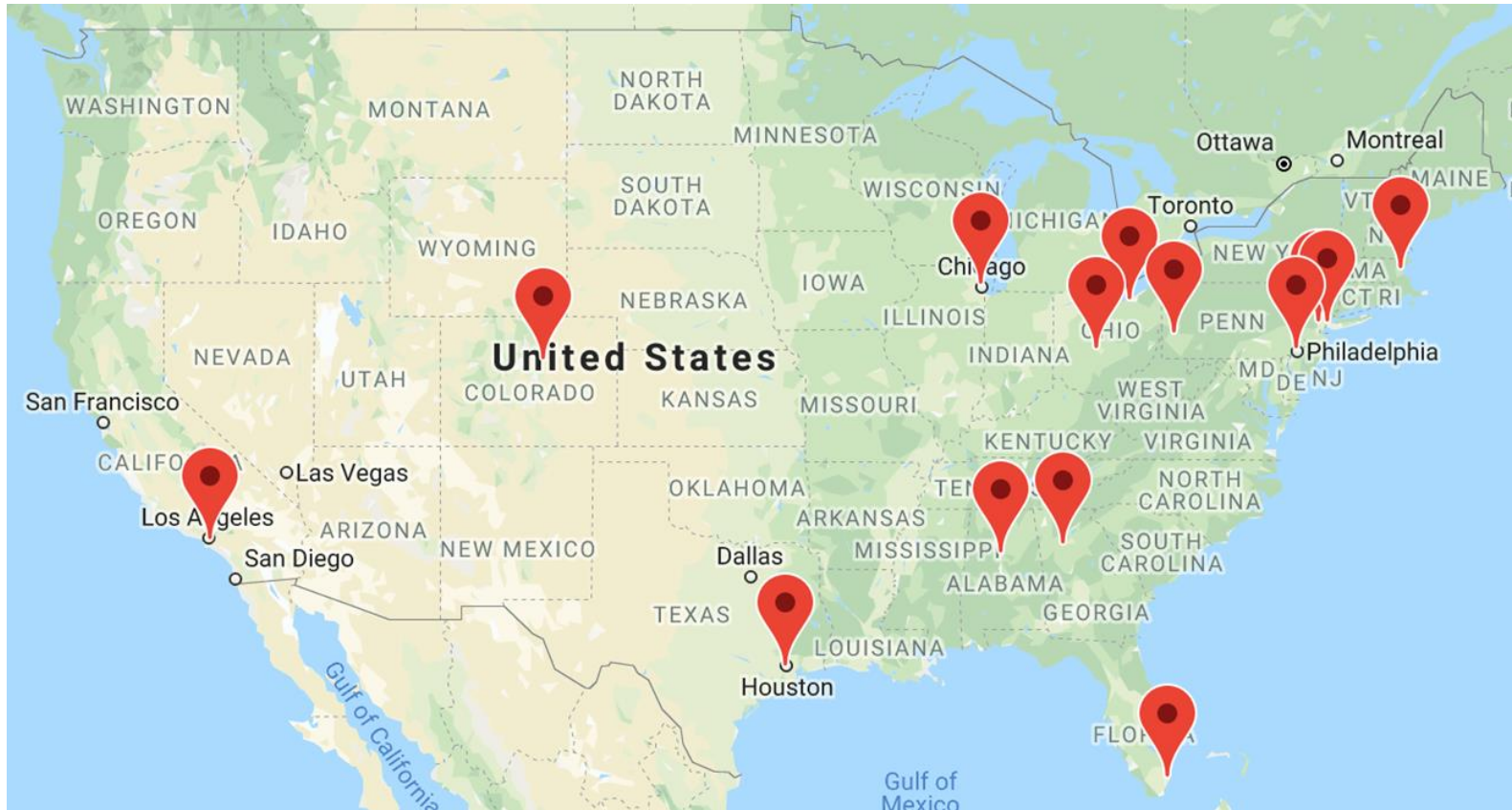
Conducts one clinical study which will impact the lives of someone with SCI/TBI

Contributes longitudinal data to a National Database (NDB) in order to track the long-term consequences of injury

Collaborates on studies with other Model Systems (Modular Projects)

Collaboration with the Model Systems Knowledge Translation Center (MSKTC) to provide scientific results and information to stakeholders

CURRENT SCIMS



DEFINITION OF SCI AND INCLUSION CRITERIA

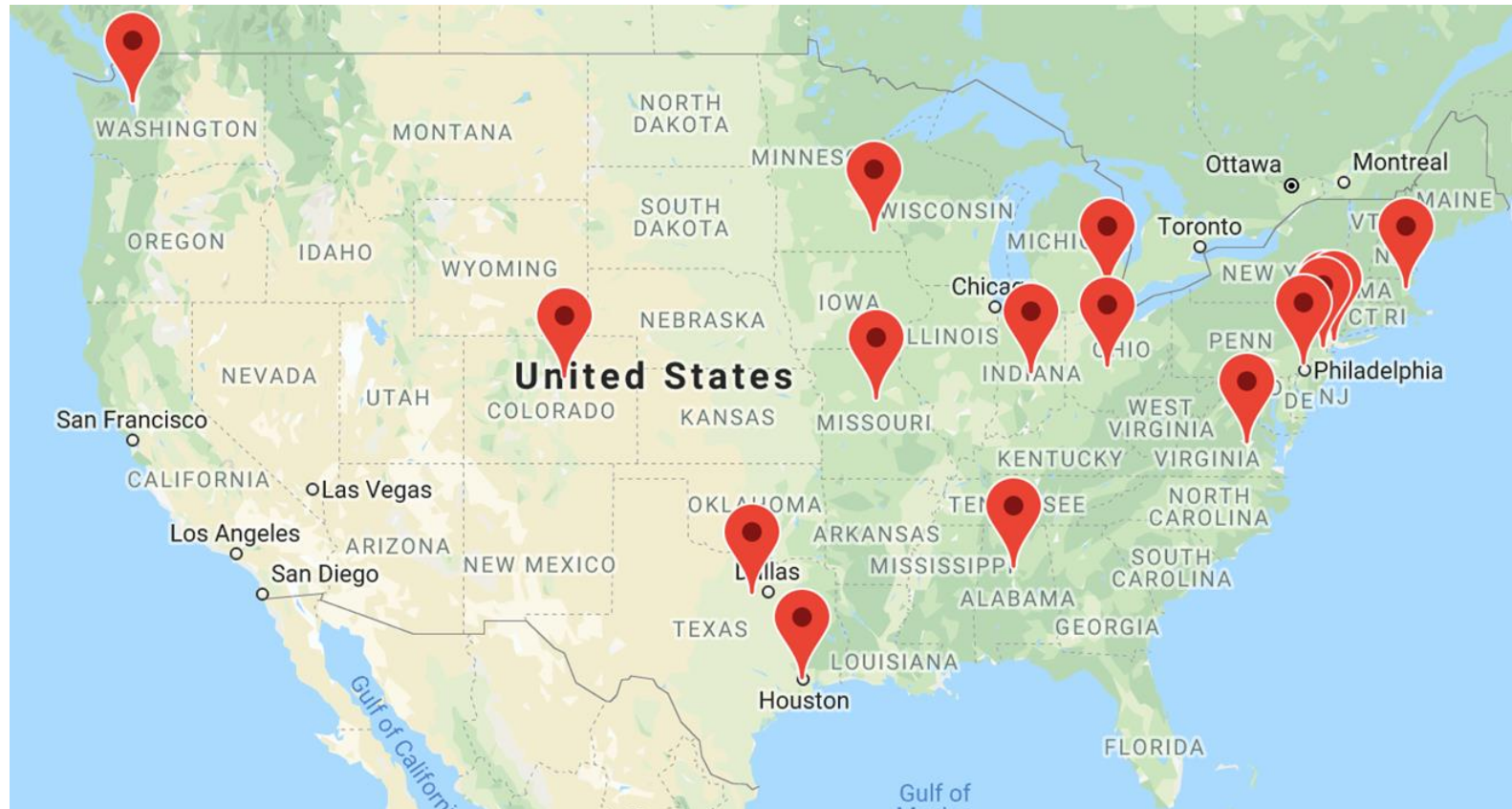


“an acute traumatic lesion of neural elements in the spinal canal (spinal cord and cauda equina), resulting in temporary or permanent sensory and/or motor deficit involving an external event to trigger the injury rather than disease or degeneration”

Inclusion Criteria

- Presence of an external traumatic event that results in a spinal cord injury, including surgical procedures, radiation, and medical complications.
- Temporary or permanent loss of sensory and/or motor function as a result of the traumatic event.
- Admission to the system within one year of injury
- Resides in the geographic catchment area of the system at the time of the injury (and is expected to stay in the catchment area)
- Informed consent is signed by patient, family or guardian

CURRENT TBIMS



DEFINITION OF TBI AND INCLUSION CRITERIA



Damage to brain tissue caused by an external mechanical force as evidenced by medically documented LOC or PTA due to brain trauma or by objective neurological findings that can be reasonably attributed to TBI on physical examination or mental status examination

Inclusion Criteria:

- Moderate to severe TBI (PTA>24 hrs or LOC>30 minutes or GCS in ED<13 or intracranial neuroimaging abnormalities)
- Admitted to system's hospital emergency department within 72 hours of injury
- 16 years of age or older at the time of injury
- Receives acute care and comprehensive inpatient rehabilitation within the model system hospitals
- Informed consent is signed by patient, family or guardian

FOR MORE INFORMATION...



Craig Hospital Research: <https://craighospital.org/programs/research>

NIDILRR: <https://acl.gov/about-acl/about-national-institute-disability-independent-living-and-rehabilitation-research>

SCIMS NDB: <https://www.nscisc.uab.edu/>

TBINDSC: <https://tbims.tbindsc.org/>

MSKTC: <http://msktc.org/>



“A MODEL SYSTEM MUST BE ABLE TO MEET THE NEEDS OF A PERSON WITH SCI BY COMPETENTLY TREATING THE DIRECT INJURY AS WELL AS ALL ORGAN SYSTEMS AFFECTED (OF WHICH THERE ARE MANY); THE FUNCTIONAL DEFICITS THAT RESULT, BY PROVIDING TRAINING AND EQUIPMENT; THE PSYCHOLOGICAL ADJUSTMENTS THAT MUST BE MADE; THE VOCATIONAL/AVOCATIONAL PURSUITS THAT MUST BE CHANGED; AND THE PROVIDING OF LONG-TERM SPECIALIZED CARE.”

~JOHN YOUNG, M.D.
FORMER MEDICAL DIRECTOR
AT CRAIG HOSPITAL

THE MODEL SYSTEM PROJECT



Since its inception, a total of 31 centers have been funded by NIDILRR and there are currently 14 funded Model Systems.

“The SCI Model Systems are specialized programs of care in SCI that gather information and conduct research with the goal of improving long-term functional, vocational, cognitive, and quality-of-life outcomes for individuals with SCI” and the goal of this research is translation.^{1.Chen et.al.}

UTILIZATION OF DATA FROM THE MODEL SYSTEM



“Each SCI Model System is charged with disseminating information and research findings to patients, family members, health care providers, educators, policymakers, and the general public.”

The dissemination of the research from the model systems has informed practitioners providing patient care, health care systems, and the information through publication and dissemination has been utilized hundreds of thousands of times on 6 continents via way of the **Model Systems Knowledge and Translation Center.**

MSKTC FACT SHEETS



Depression and Spinal Cord Injury

Safe Transfer Technique

Wheelchair Information



Employment after Spinal Cord Injury



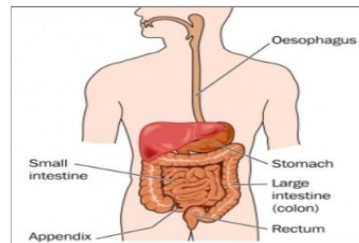
Spasticity and Spinal Cord Injury



Spinal Cord Injury and Gait Training



Understanding Spinal Cord Injury

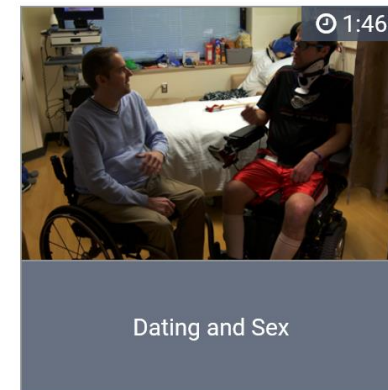
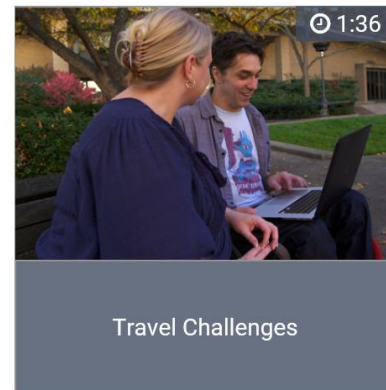
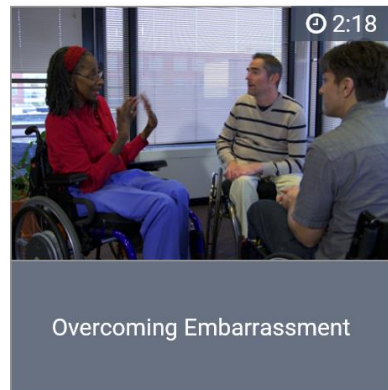
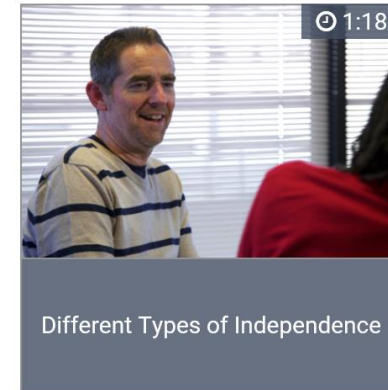
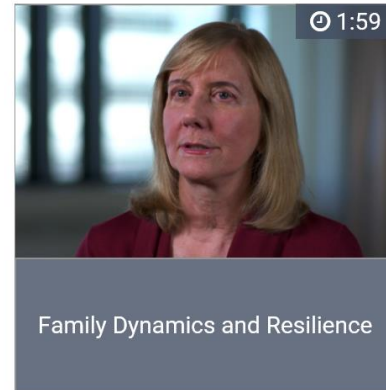
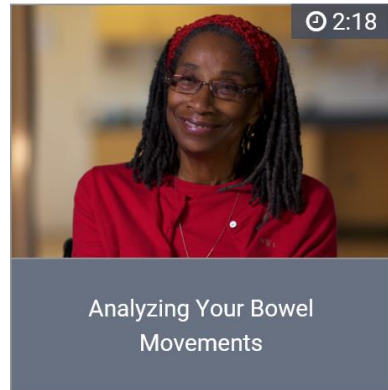


Bowel Function After Spinal Cord Injury



Pregnancy and Women with Spinal Cord Injury

MSKTC VIDEOS



REHABILITATION



Definition: The action of restoring someone to health or normal life through training and therapy after imprisonment, addiction, or illness.

JB Definition: Providing the latest data-driven care to provide maximal health, independence, and quality of life from the inception of injury until death.

KEY STATISTICS



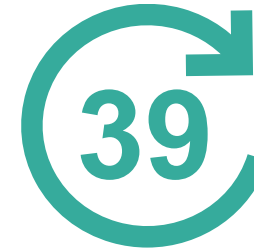
18,000
annually in
USA
SCI



2.8 million
annually in
USA
TBI



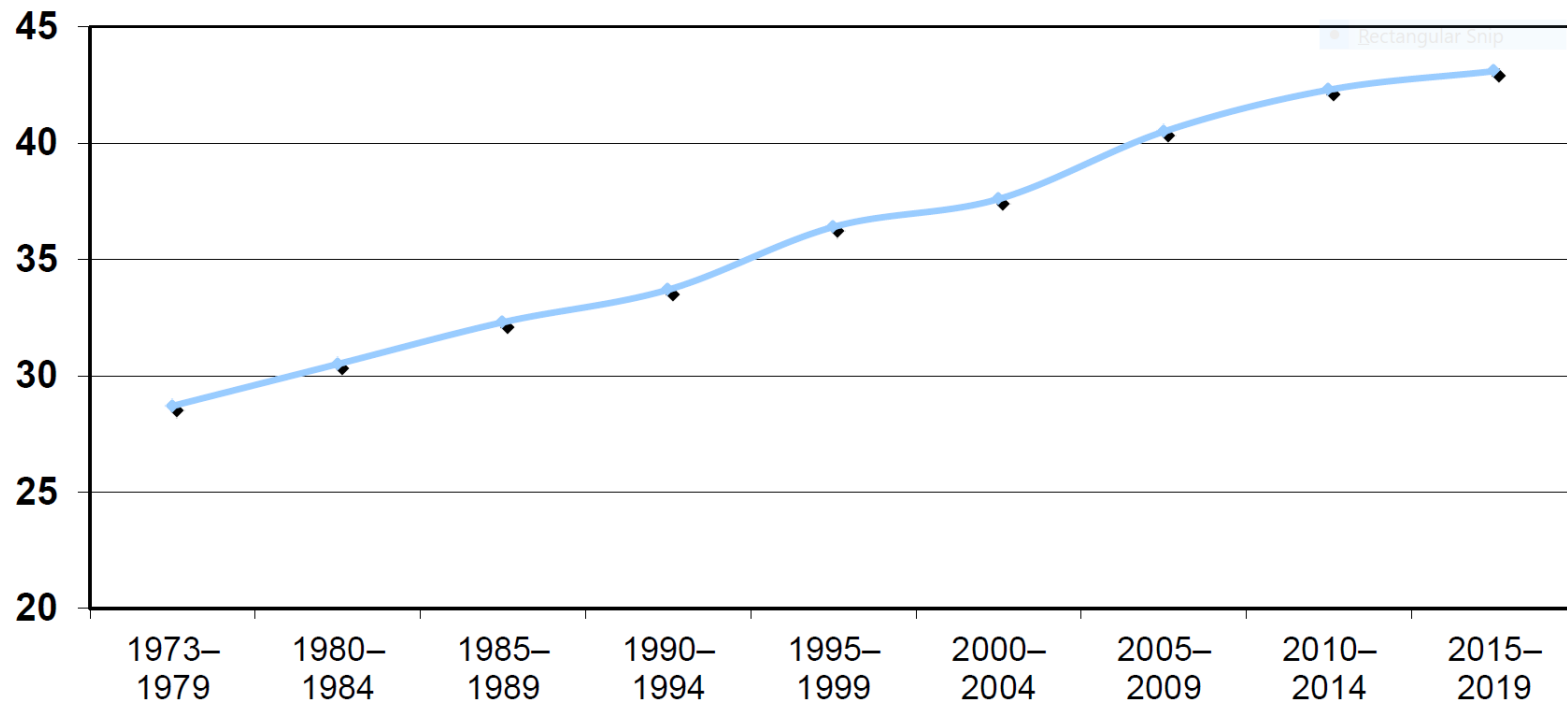
80%
male



Avg
age

**Craig Hospital
statistic*

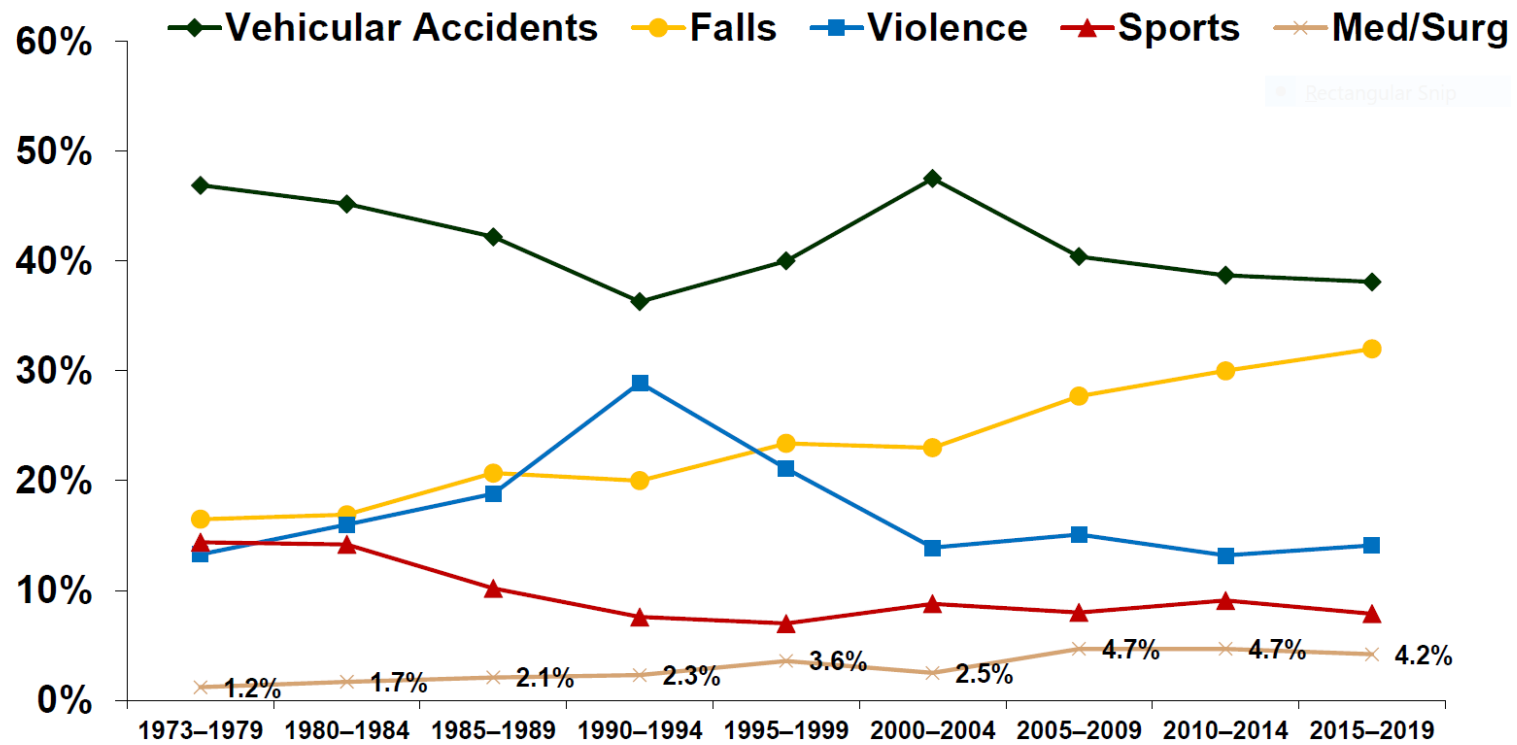
DATA FROM THE MODEL SYSTEMS



Males: 27,453 (80.4%)

Females: 6,672 (19.6%)

WHO GETS INJURED



SURVIVABILITY



Age	Survive first 24 hours: Motor Fx, Any Level	Survive first 24 hours: Para	Survive first 24 hours: Low Tetra (C5–C8)	Survive first 24 hours: High Tetra (C1–C4)	Survive first 24 hours: Vent. Dep., Any Level	Survive >1 year post injury: Motor Fx, Any Level	Survive >1 year post injury: Para	Survive >1 year post injury: Low Tetra (C5–C8)	Survive >1 year post injury: High Tetra (C1–C4)	Survive >1 year post injury: Vent. Dep., Any Level
20	52.0	44.7	39.1	32.5	9.8	52.0	44.7	39.1	32.5	9.8
40	34.8	29.5	24.7	20.6	8.6	34.8	29.5	24.7	20.6	8.6
60	19.2	16.0	13.0	11.1	3.6	19.2	16.0	13.0	11.1	3.6

MODEL SYSTEMS SITE SPECIFIC PROJECTS



Center	Project Title
Northeast Ohio Regional Spinal Cord Injury System (OH)	Early Characterization of UE Paralysis in Cervical SCI as a Means to Informing Prognosis and Guiding Time-critical Interventions Methods for the Reduction of “Unavoidable” Pressure Ulcers in Persons with Acute SCI
Ohio Regional SCI Model System (OH)	Prediction of SCI-Associated Infections (SCI-AI) by Markers of Autonomic Instability (the ADDITION-SCI Study – Autonomic Dynamic Dysfunction to predict InfecTIONS after SCI)
Regional SCI Center of the Delaware Valley (PA)	Feasibility of Tele-rehabilitation-Supported Home Activity-Based Rehabilitation for the Upper Extremity in Persons with Cervical Incomplete Spinal Cord Injury

THE INCEPTION OF INJURY – EARLY ACUTE CARE



Many advances in the acute care of people who have suffered from a traumatic SCI have come from research in the model systems project or in the advocacy of clinicians in the model systems in the acute trauma setting. These advances that are currently in practice are...

- The timing of surgery
- Spinal Decompression and Durotomy or Durectomy with Duroplasty
- Measuring Spinal Cord Perfusion Pressures and Map Goals
- Early Exercise in the ICU

THE ACUTE INPATIENT REHABILITATION PROCESS



Goal:

- **Maximize** neuro-recovery and improve independence .
- **Teach** patients to prevent secondary complications associated with SCI.
- **Teach** health and wellness as well as a healthy lifestyle with SCI.
- **Teach** self-advocacy.
- **Provide psychological support** for adjustment to injury.
- **Partner** with the patient for goal setting to target individual needs.
- **Provide** opportunities for community reentry.

THE VOCATIONAL PURSUITS



- Return to School
- Return to Work
- Return to Volunteerism
- Return to Parenting

Advocating for equal pay, a fair wage, without the loss of vital services based on income.

HEALTH AND WELLNESS – A MEDICAL HOME MODEL



- Male and Female Fertility and Infertility with SCI
- Bone Health Clinic
- Cardiovascular Disease, Dyslipidemia, and Insulin Resistance
- Diet, Nutrition, and Energy Expenditure
- Urological Care
- Psychological Support, Peer Mentoring, and Support Groups
- Pulmonary Care
- Hematologic Care
- Research

ADVOCACY FOR DISABILITY RIGHTS



- ✓ Hospital Level
- ✓ State level
- ✓ Nationwide
- ✓ Worldwide



OUTCOMES YOU SHOULD ASK ABOUT



82%

Of patients were discharged to **home**



1.6

Hours of **attendant care** on average 1 year post discharge



50%

Of BI patients were **back to work** 1 year post discharge



40%

Of SCI patients were **back to work** 1 year post discharge



100%

Of our **high school & college-age patients** return to school at grade level



94%

Increase on average in **patient mobility** as measured by CMS Care Tool

WHAT DOES THIS MEAN?



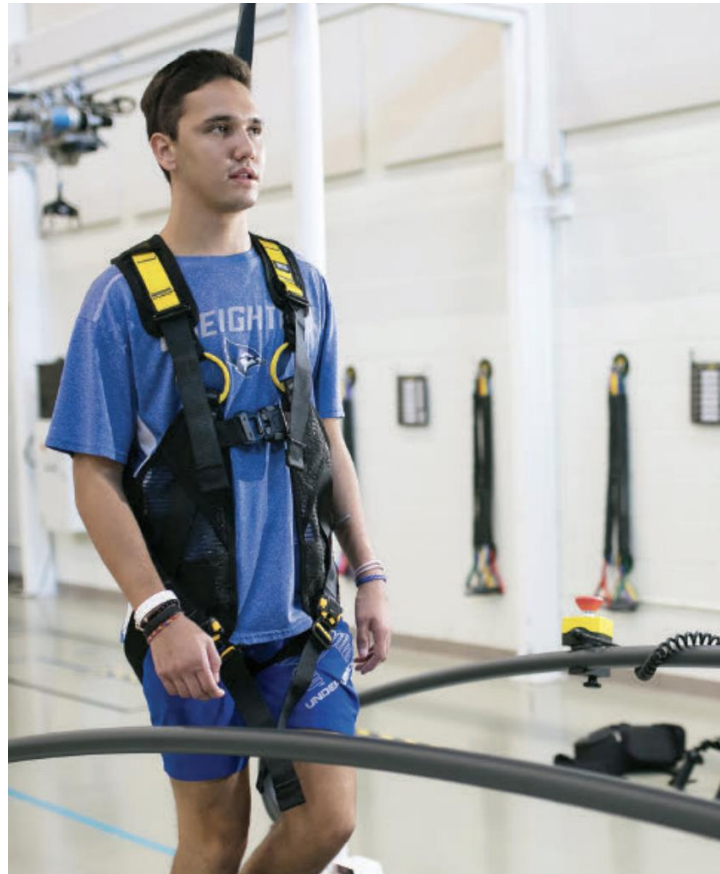
Model System functional patient outcomes are superior compared to almost every national average; graduates are:

- More dependent when they are admitted
- Make **greater functional gains** during their initial treatment
- Are **discharged home** at higher rates
- **Return to work or school** in greater numbers
- Are more **functionally independent**
- Require **less attendant care**
- Have **fewer re-hospitalizations**
- Have **higher levels of community reintegration**, and life satisfaction
- Have **higher earning power** than those treated in programs

EXPECT STATE-OF-THE-ART GYMS & EQUIPMENT

Trusted
SAFETY NATIONAL

Since 1942



ASK ABOUT PATIENT-FAMILY HOUSING



Many model systems have a wide variety of programs specifically designed to support families of patients, including housing for outpatients and families of inpatients, either on-site in a family housing facility, or in a nearby housing option.



PATIENT ROOMS SHOULD BE CUSTOMIZED



- Smart rooms
- Environmental controls
- Voice activated
- State-of-the-art
- Privacy and safety



TECHNOLOGY SHOULD BE UTILIZED FOR INDEPENDENCE



Assistive tech teams are specially-trained occupational and speech therapists who provide hands-on education and training about technological resources for patients, their families and others in the community.

The goal is to equip patients to communicate with family and friends, increase their independence to control their environment, and achieve their work/school goals.



Craig's Upper Extremity Lab provides range of motion technology in the hands and helps people be more independent with activities of daily living.



Assistive Technology, Therapeutic Recreation and Rehabilitation Engineering offer patients many opportunities to use technology for work and play.

TEAM APPROACH IS CRITICAL

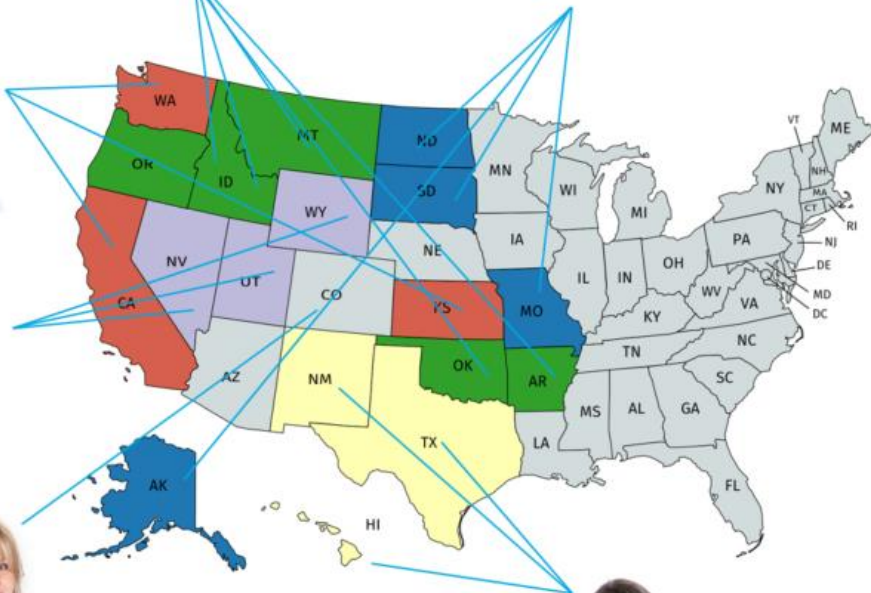
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CLINICAL LIAISONS

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Once referred, each patient should be assessed in the acute care hospital and evaluated for admission readiness by an experienced SCI or brain injury clinical liaisons before admission.

Model Systems typically provide this assessment and patient/family education free of charge.

PATIENT & FAMILY EDUCATION



Education is imperative to rehabilitation and independence. Model systems have multiple subspecialty clinics and educational programs, such as:

- Airline travel training
- Rehab engineering workshop
- Sexuality and fertility resources
- Adaptive equipment and assistive tech

EXPECT A PEER MENTOR PROGRAM



Peer mentors are volunteers who are available to meet with patients and family members regarding their rehabilitation experience and return to home.

These graduates or family members of grads who have experienced a spinal cord injury and/or brain injury and are available to:

- Provide support
- Share common experiences
- Encourage patients and family members through this challenging time of rehabilitation



ADDITIONAL PROGRAMS/SERVICES AVAILABLE AT SOME OR ALL MODEL SYSTEMS



Some of the activities Craig offers our inpatients and outpatients include:

COMMUNITY OUTINGS

- Parks + open spaces
- Entertainment venues
- Professional sporting events
- Restaurants

HOBBIES

- Potter's wheel
- Clay sculpting
- Cooking
- Stained glass
- Photography
- Leather crafts
- Drawing + painting

WATER SPORTS

- Swimming
- Scuba Diving
- Hobie Cat Sailing
- Rafting
- Canoeing/Kayaking

SPORTS

- Power wheelchair bowling
- Quad rugby
- Wheelchair basketball
- Wheelchair tennis
- Cycling (hand- and foot pedal bikes)
- Golf (modified accessible golf cart)

HORTICULTURE THERAPY

- On-site greenhouse
- Accessible garden with raised planters and beds
- Modified tools and equipment

OUTDOOR ACTIVITIES

- Fishing (sip and puff pole available)
- RC sail boating
- Winter Skiing
- Downhill mountain biking
- Snowmobiling/ATVs
- Hunting/Shooting (sip and puff rifle)

IN-HOUSE ACTIVITIES

- Pet therapy
- Staff-guided crafts
- Blow darts
- Musical instruments
- Singing
- Theater room
- Billiards
- Foosball
- Air hockey
- Table tennis
- Casino night
- Library of movies, books, games and music
- Adaptive video gaming
- Computer lab

ADDITIONAL SERVICES AND PROGRAMS OFFERED AT CRAIG

- Adaptive Driving
- Adventure Program
- Airline Travel Training
- Aquatic (Pool) Therapy
- Assistive Technology
- Attendant Care Training
- Brain Injury Activity Room
- Ceramics (Kiln)
- Chaplain & Worship Services
- Closed-Circuit TV Education
- Community Reintegration Services
- Daily Living Skills & Personal Care
- Dental Services On-site
- Dietary and Nutrition
- Family Education Classes & Training
- Hand Evaluations, Bracing & Surgery
- Health/Wellness Center
- Horticulture Therapy
- Interpreter Services
- Music Therapy
- Neurosurgical Consultations & Surgery
- Orthotics Program
- Outpatient & Follow-up Services
- PEAK Center
- Personalized Equipment Coordination
- Pet Therapy
- Pharmacy & Pharmacologic Consultations
- Podiatry Clinic
- Prevention Programs
- Radiology & Neuroradiology
- Rehabilitation Engineering
- School Teacher
- Seating & Positioning Clinic
- Sexuality, Intimacy & Fertility Resources
- Spasticity Clinic
- Stress Management Classes
- Skin/Wound Care Program
- Teen Rehab at Craig (TRAC)
- Terrain Park Wheelchair Obstacle Course
- Upper Extremity Lab
- Urology/Urodynamics Clinic
- Wheelchair Demo Fleet
- Wheelchair Positioning Clinic
- Van Clinic
- Ventilator-Dependent & Weaning Programs for SCI
- Vision Clinic



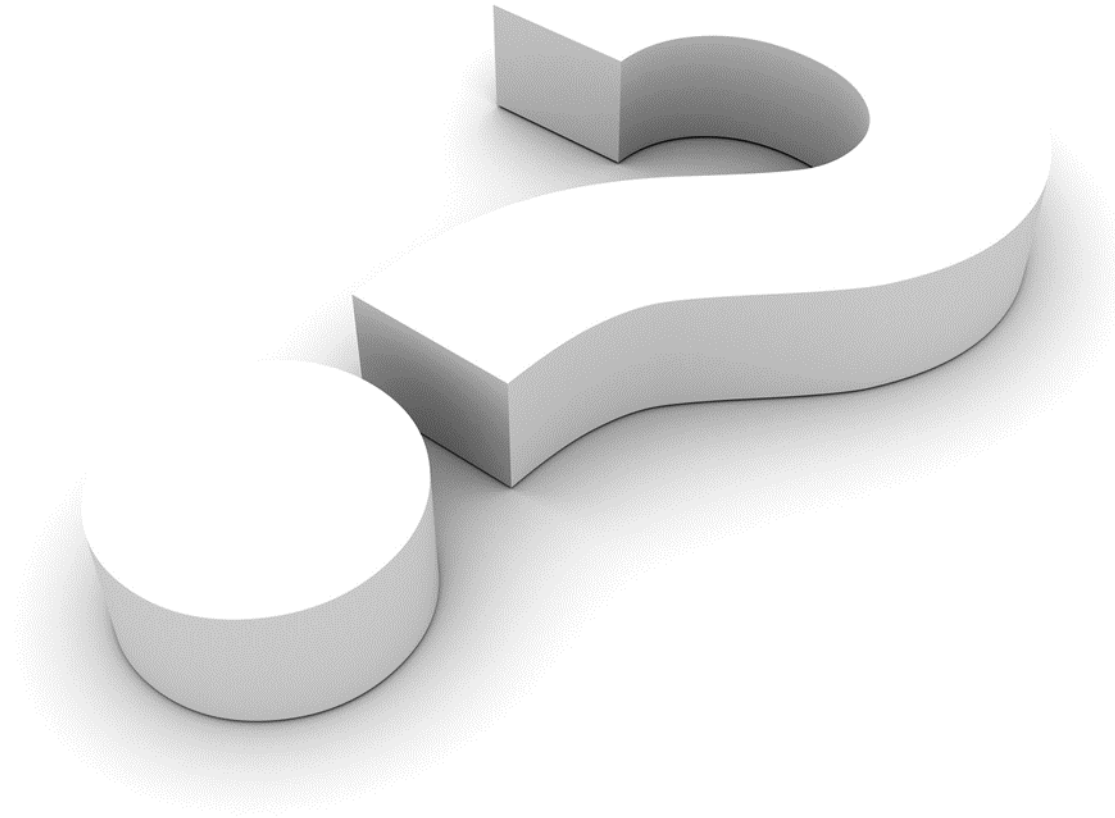
CASE STUDY



Erin Husman



QUESTIONS?



THANK YOU!



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