

# 2024

# Howard H. Steel

## CONFERENCE

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**DECEMBER 13-16**

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# Howard H. Steel

## CONFERENCE

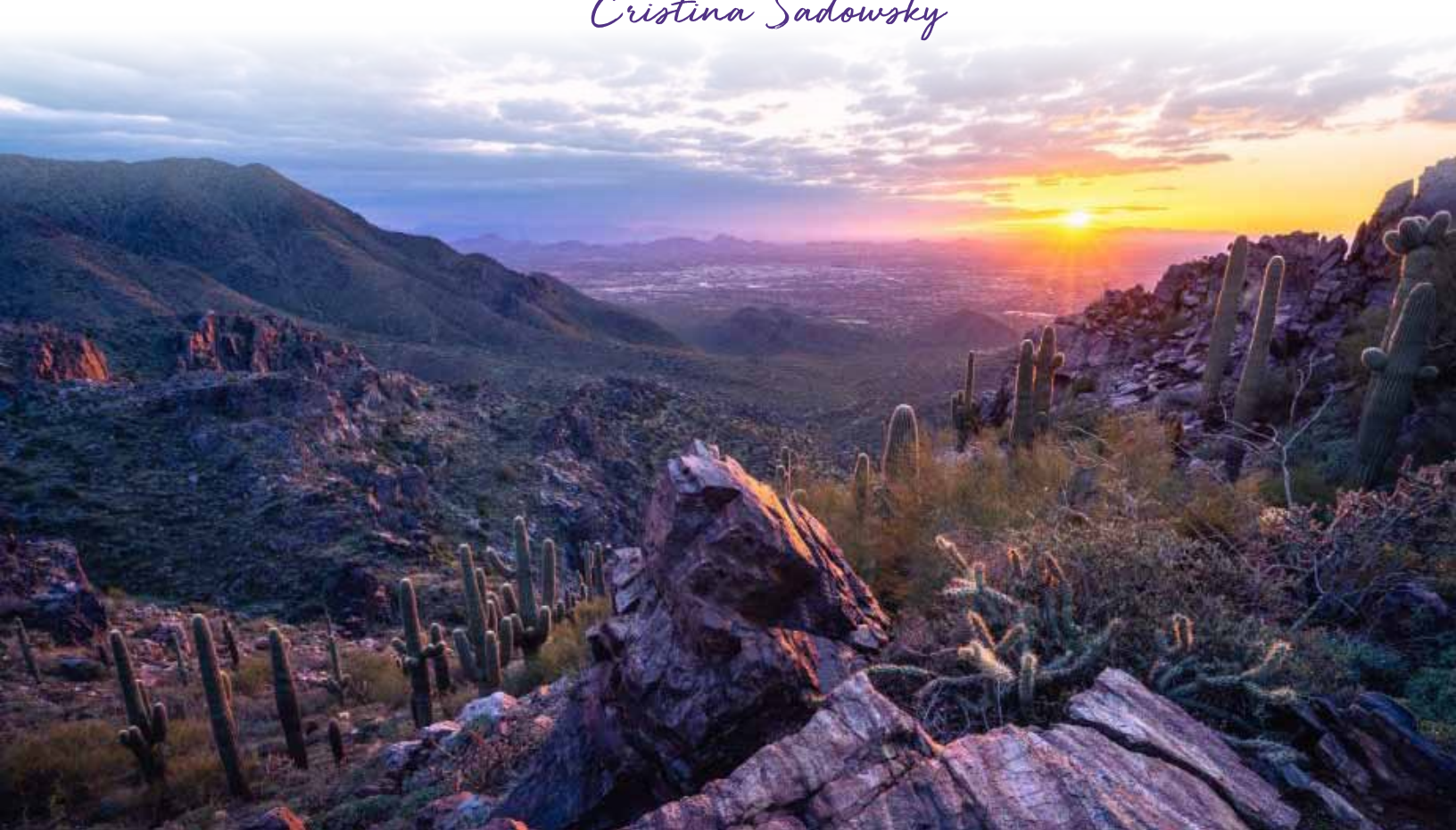
on Pediatric Spinal Cord Injury/Dysfunction

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*Randal R. Betz, MD*  
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# Howard H. Steel

## CONFERENCE

on Pediatric Spinal Cord Injury/Dysfunction

Friday, December 13

### PRECOURSE:

## Stimulating the Conversation:

### Moving Neuromodulation from Adults to Children

**LOCATION:** Trailblazers D/E

Time	Topic/Title	Presenter
8:00 AM	<b>Welcome</b>	Rebecca Martin, OTR/L, OTD • Baltimore, MD, USA
8:05 AM	Overview of NM Modalities and Evolution in Clinical Practice	Monica Perez, PT, PhD • Chicago, IL, USA
8:35 AM	Q & A	
8:50 AM	Lessons from Deep Brain Stimulation: From Adults to Peds Barriers to Use of Neuromodulation Technologies in Peds: Lessons and Opportunities.	Ammar Shaikhouni, MD, PhD • Columbus, OH, USA
9:20 AM	Q & A	
9:35 AM	<b>Break</b>	
	<b>Autonomic Function/B&amp;B, Trunk/Posture</b>	<b>Moderator:</b> Laura Krisa, PhD • Philadelphia, PA, USA
9:50 AM	Spinal Cord Stimulation and Cardiovascular Effects in SCI	Dr. Andrei Krassioukov, MD, PhD, FRCPC, FASIA • Vancouver, BC, Canada
10:10 AM	Opportunities for Tibial Nerve Stimulation in Pediatric Neurogenic Bladder Management	Argyrios Stampas, MD • Houston, TX, USA
10:30 AM	Q & A	
10:40 AM	Neuromodulation of Spinal Sensorimotor Networks Using Invasive and Non-Invasive Spinal Stimulation: "Determining the Right Fit"	Dimitry Sayenko, MD, PhD • Houston, TX, USA
11:00 AM	Neuromodulation to Enhance Sitting Posture and Trunk Control in Children with Spinal Cord Injury	Goutam Singh, PhD • Louisville, KY, USA
11:20 AM	Q & A	
11:35 AM	<b>Lunch</b>	
	<b>Upper Extremity</b>	<b>Moderator:</b> Rebecca Martin, OTR/L, OTD
12:35 PM	Paired Associative Stimulation Following SCI	Monica Perez, PT, PhD • Chicago, IL, USA
12:50 PM	Amplifying Activation: Training + Non-Invasive Spinal Stim to Improve Hand/Arm Function in SCI	Edelle Field-Fote, PT, PhD, FAPTA, FASIA • Atlanta, GA, USA
1:05 PM	Q & A	
1:20 PM	<b>Break</b>	
	<b>Lower Extremity/Ambulation</b>	<b>Moderator:</b> Dana R. Johnson, PT, DPT • Philadelphia, PA, USA
1:35 PM	Pediatric Cerebral Palsy and Neuromodulation	Parag Gad • Northridge, CA, USA Kristin Girshin, PT, DPT, PCS • Upland, CA, USA
1:50 PM	Transcutaneous Spinal Cord Stimulation to Enable Stepping in Children with SCI	Katie Lucas, PT, DPT, PhD • Phoenix, AZ, USA
2:05 PM	TSS+ Training improves Walking in Children with SCI	Lia Brunn OTR/L, OTD • Baltimore, MD, USA
2:20 PM	Transcutaneous and Epidural Stimulation to Impact Voluntary Stepping in SCI	Claudia Angeli, PhD • West Orange, NJ, USA
2:35 PM	Q & A	
2:50 PM	Considerations to Move Forward from Adults to Children. A Call to Action.	Andrea Behrman, PhD, PT, FAPTA • Louisville, KY, USA
3:05 PM	Q & A	
3:20 PM	<b>Wrap-up</b>	

Time	Topic/Title	Presenter(s)	Moderator
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**Friday, December 13, 2024 • PRECOURSE**

7:30 AM-8:00 AM	<b>Registration</b>		
8:00 AM-3:30 PM	<b>Precourse Program</b>		<b>LOCATION: Trailblazers D/E</b>
4:00 PM-6:00 PM	<b>Registration, Hang Posters, Vendor Set Up</b>		
6:00 PM-8:00 PM	<b>Welcome Reception</b> The Westin-Kierland Resort & Spa		
	<b>LOCATION: Northern Sky Terrace</b>		



**Saturday, December 14, 2024 • CONFERENCE**

**LOCATION: Trailblazers D/E**

7:00 AM-7:45 AM	<b>Registration &amp; Continental Breakfast with Partners &amp; Exhibitors</b>		
7:45 AM-8:30 AM	<b>Opening Session with Partner Recognition</b>	MJ Mulcahey, PhD, OTRL Philadelphia, PA, USA	
8:30 AM-9:30 AM	<b>Session #1: ● Click here for Abstracts</b> <b>Diaphragmatic Pacing and Neuromodulation</b>		Eimear Smith, MD Dublin, Ireland
	The Role of Diaphragm Pacing in the Non Spinal Cord Injured Pediatric Population: Decreasing Invasive Mechanical Ventilation	Raymond Onders, MD Cleveland, OH, USA	
	The Role of Diaphragm Pacing in Pediatric Spinal Cord Injury: Decreasing Invasive Mechanical Ventilation	Raymond Onders, MD Cleveland, OH, USA	
	Transcutaneous Stimulation to Improve Trunk Control: Impact on Autonomic Nervous System in Children with Spinal Cord Injury	Goutam Singh, PT, PhD Louisville, KY, USA	
	Paired Associative Stimulation After Pediatric Incomplete Spinal Cord Injury: A Protocol	Piia Haakana, PhD Candidate Helsinki, Finland	
	Transcutaneous Spinal Stimulation Is Safe, Feasible, and Promising for Improved Walking in Children with Acute Flaccid Myelitis	Elizabeth Neighbors, PT, DPT Baltimore, MD, USA	
9:30 AM-10:30 AM	<b>Session #2:</b> <b>Course - Respiratory Pacing</b>		
	The Road Less Traveled: Respiratory Pacing for Children with Cervical Spinal Cord Injury	Tami McMichael, MS, APRN CPNP, Course Director Baltimore, MD, USA	● Click here for Abstract
10:30 AM-11:00 AM	<b>Poster Session 1 ■ Click here for Poster Abstracts</b>		<b>LOCATION: Trailblazers A</b>
10:30 AM-11:00 AM	<b>Break with Partners &amp; Exhibitors</b>		<b>LOCATION: Trailblazers C</b>

continued



# Howard H. Steel CONFERENCE on Pediatric Spinal Cord Injury/Dysfunction

Time	Topic/Title	Presenter (s)	Moderator
<b>Saturday, December 14, 2024 (continued)</b>			
<b>LOCATION: Trailblazers D/E</b>			
11:00 AM-12:00 PM	<b>Session #3: ● Click here for Abstracts</b> <b>Implications of Wheeled Mobility on the Upper Limb</b>		Loren Davidson, MD Sacramento, CA, USA
	Shoulder Pathology in Pediatric Manual Wheelchair Users with Spinal Cord Injury or Dysfunction	Alysa J. Schnorenberg, PhD Milwaukee, WI, USA	
	Intrinsic Factors and Shoulder Pain in Young Adult Manual Wheelchair Users with Pediatric-Onset Disability	Matthew Hanks, PhD, ATC Urbana-Champaign, IL, USA	
	Classification and Diversity of Stroke Pattern Use in Pediatric Manual Wheelchair Users	Alyssa, Schnorenberg, PhD Milwaukee, WI, USA	
	Wheelchair Fit and Patient-Reported Outcomes in Manual Wheelchair Users with Pediatric SCI/D	Brooke Slavens, PhD, MS Milwaukee, WI, USA	
	Wheelchair Fit and Accessories to Prevent Upper Limb Impairment	Dana Johnson, DPT Philadelphia, PA, USA	
12:00 PM-12:45 PM	<b>The Stephen M. Haley Memorial Lecture:</b> <b>The Current &amp; Future Management of Pediatric Spinal Cord Injury</b>	Nicholas Theodore MD, MS Director of the John Hopkins Neurosurgical Spine Center	Cristina Sadowsky, MD Baltimore, MD, USA
12:45 PM-12:50 PM	<b>Stretch Break</b>		
12:50 PM-1:50 PM	<b>Session #4:</b> <b>The Critically Injured Child</b>		Randal R. Betz, MD Lawrenceville, NJ, USA
	Management of the Multi-Injured Child with Spine Trauma	Jessica Burns, MD Phoenix, AZ, USA	
	Panel Discussion	Jessica Burns, MD Jamal McClendon, Jr., MD Tami McMichael, CPNP Ray Onders, MD Nicholas Theodore, MD Cristina Sadowsky, MD	Craig M. McDonald MD Sacramento, CA, USA
1:50 PM	<b>Adjourn / Lunch on Own / Afternoon Off</b>		

continued



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Time	Topic/Title	Presenter (s)	Moderator
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**Sunday December 15, 2024 • CONFERENCE**

7:00 AM-7:30 AM	<b>Registration and Continental Breakfast with Partners &amp; Exhibitors</b>		
7:30 AM-8:00 AM	<b>Session #5: ● Click here for Abstracts Award-Eligible Poster Presentations &amp; Breakfast</b>	<b>LOCATION: Trailblazers D/E</b>	Randal R. Betz, MD Lawrenceville, NJ, USA
	1. Epidemiology of Pediatric Spinal Cord Injury in Ireland 2016 - 2025	Eimear Smith, MD Dublin, Ireland	
	2. Subthreshold TMS-Induced Supraspinal Modulation of Spinal Excitability in Children and Adolescents	Piia Haakana, PhD Candidate Helsinki, Finland	
	3. Dissemination of a Newly Revised Evidence Based Pediatric Neurogenic Bowel Management Standard of Care (SOC)	Louise Rudden, NP Toronto CA, USA	
	4. Muscle Mass, Bone Mineral Density, and Functional Outcome Scores in Children with Spinal Cord Injuries	Isabella Ferrara Baltimore, MD, USA	
	5. Noninvasive Spinal Stimulation with Activity-Based Training to Improve Trunk Control in Children with Spinal Cord Injury	MacKenzie Goode-Roberts, PT, DPT Louisville, KY, USA	
	6. Emergency Department Visits for Children with Spinal Cord Injury: Reasons for Visits and Associated Hospitalization	Jennifer Thompson, MD Louisville, KY, USA	
8:00 AM-8:30 AM	<b>Poster Session 2 ■ Click here for Poster Abstracts</b>	<b>LOCATION: Trailblazers A</b>	
8:00 AM-8:30 AM	<b>Break with with Partners &amp; Exhibitors</b>	<b>LOCATION: Trailblazers C</b>	
8:30 AM-9:15 AM	<b>Keynote Talk: Paediatric Spinal Cord Injury Epidemiology: Findings and Opportunities for Collaboration</b>	<b>LOCATION: Trailblazers D/E</b>	Jacquelyn Cragg, MPH, PhD University of British Columbia, Canada Linda Jones, PhD Boulder, CO, USA
9:15 AM-10:25 AM	<b>Session #6: ● Click here for Abstracts Pediatric SCI/D Rehabilitation and Outcomes</b>	<b>LOCATION: Trailblazers D/E</b>	Kyle Deane, PhD Chicago, IL, USA
	Use of the Physical Abilities and Mobilities Scale (PAMS) in Children Receiving Inpatient Rehabilitation	Courtney Porter PT, DPT Baltimore, MD, USA	
	Participation During Youth- Experiences from Young Adults with Pediatric-Onset Spinal Cord Injury	Karin Erklint Linköping, Sweden	
	What Happens when Children Grow Up? Living with Pediatric-Onset Spinal Cord Injury	Kathy Zebracki, PhD Chicago, IL, USA	
	Rehabilitation Outcomes of Pediatric Inpatients with Transverse Myelitis	Charlotte Davis London, United Kingdom	
	Chronic Rehabilitation of the Pediatric Patient with Spinal Cord Injury	Courtney Porter PT, DPT Baltimore, MD, USA	
	Decision-Making for Health of Children with Spinal Cord Injury: A Qualitative Study of Caregivers	Jennifer, Thompson MD Louisville, KY, USA Jacob Lewis, BS Louisville, KY, USA	

continued

# Howard H. Steel CONFERENCE on Pediatric Spinal Cord Injury/Dysfunction

Time	Topic/Title	Presenter (s)	Moderator
<b>Sunday December 15, 2024 (continued)</b>			
10:25 AM-10:55 AM	<b>Poster Session 3</b> ■ <a href="#">Click here for Poster Abstracts</a>	<b>LOCATION: Trailblazers A</b>	
10:25 AM-10:55 AM	<b>Break with Partners &amp; Exhibitors</b>	<b>LOCATION: Trailblazers C</b>	
10:55 AM-11:55 AM	<b>Session #7: CONCURRENT COURSES Speech, and Scoliosis</b>		
	Ahead of the Curve: Alternative Considerations for Management of Scoliosis following Pediatric Spinal Cord Injury	Stacey Hall, DO Houston, Texas, USA Simra Javaid, DO, Course Director Houston, TX, USA Anthony Kennedy, MS, OT, OTR/L Houston, Texas, USA Emily Klein, PT, DPT Houston, Texas, USA	● <a href="#">Click here for Abstract</a>
	<b>LOCATION: Trailblazers D/E</b>		
	What's Speech Got to Do With It?	Glendaliz Bosques, MD, Course Director Austin TX, USA	● <a href="#">Click here for Abstract</a>
	<b>LOCATION: Trailblazers B</b>		
11:55 AM-12:55 PM	<b>Session #8: Cognitive Appraisals and Perceived Injustice Following Spinal Cord Injury</b>	<b>LOCATION: Trailblazers D/E</b>	
	Cognitive Appraisals in Pediatric-Onset Spinal Cord Injury	Kyle Deane, PhD Chicago, IL, USA	● <a href="#">Click here for Abstract</a>
	Cognitive Appraisals of Disability and Spinal Cord Injury: A Pediatric Measure for Children and their Parents/Caregivers	Alexis M. Ortiz, MA Chicago, IL, USA	
	Perceived Injustice: A Distinct Psychological Construct and a Predictor of Physical and Psychological Outcomes	Kimberley R. Monden, PhD Minneapolis, MN, USA	
12:55 PM-2:30 PM	<b>Midday Break - Lunch on Own</b>		

continued

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PEDIATRIC SPINAL CORD INJURY  
& DYSFUNCTION

2024



Time	Topic/Title	Presenter (s)	Moderator
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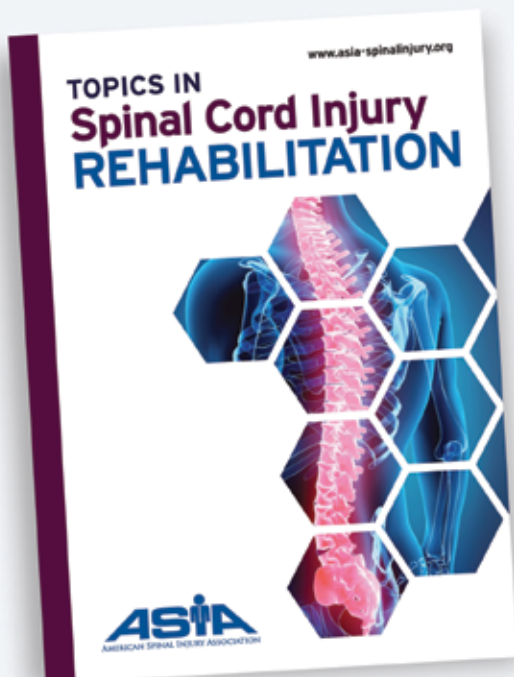
**Sunday December 15, 2024 (continued)**

2:30 PM-3:30 PM	<p><b>Session #9: CONCURRENT COURSES</b>  <b>Respiratory Management, and Ultrasound Evaluation of the Diaphragm</b></p> <p>Respiratory Management in Cervical Spinal Cord Injury/Dysfunction: A Multidisciplinary Approach</p> <p><b>LOCATION: Trailblazers D/E</b></p>	<p>Travis Edmiston, MD                      Baltimore, MD, USA                      Kofi Anoh RT                      Baltimore, MD, USA                      Kristen Chao M.S. CCC-SLP, CBIS                      Owings Mills, MD, USA                      Elizabeth Williams, PT, DPT, MS                      Baltimore, MD, USA</p>	<p>● <a href="#">Click here for Abstract</a></p>
	<p>Interdisciplinary Approach to Ultrasound Evaluation of the Diaphragm in Children with Spinal Cord Injury/Dysfunction</p> <p><b>LOCATION: Trailblazers B</b></p>	<p>Philippines Cabahug MD, FAAPMR                      Baltimore, MD, USA                      Janet Dean MS, RN, CRNP                      Baltimore, MD, USA                      Kofi Anoh RT                      Baltimore, MD, USA                      Jacqueline Newman CLS                      Baltimore, MD, USA</p>	<p>● <a href="#">Click here for Abstract</a></p>
3:30 PM-3:40 PM	<b>Stretch Break</b>		
3:40 PM-5:10 PM	<p><b>Session #10:</b>  <b>Pediatric Spinal Cord Injury Research/Clinical Trials</b></p> <p>Measuring Pertinent Outcomes and Endpoints in Clinical Trials</p> <p>Update on Adult SCI Clinical Trials</p> <p>Update on Pediatric SCI Clinical Trials</p> <p>Voices and Experiences of Children who Engage in Research</p>	<p><b>LOCATION: Trailblazers D/E</b></p> <p>MJ Mulcahey, PhD                      Philadelphia, PA, USA                      Linda Jones, PhD                      Boulder, CO, USA                      Cristina Sadowsky, MD                      Baltimore, MD, USA</p>	<p>Laura Krisa, PhD                      Philadelphia, PA, USA</p> <p>● <a href="#">Click here for Abstract</a></p>
5:10 PM-5:30 PM	<b>Break</b>		
5:30 PM-7:30 PM	<p><b>Session #11:</b>  <b>Cases and Cocktails</b></p> <p><b>LOCATION: Trailblazers A, C, D/E</b></p> <p><b>Poster Session 4</b> ■ <a href="#">Click here for Poster Abstracts</a></p> <p><b>Break with Partners &amp; Exhibitors</b></p> <p><b>Complex Cases</b></p>	 <p>Randal R. Betz, MD                      Lawrenceville, NJ, USA                      Jamal McClendon, MD                      Phoenix, AZ, USA                      Judson Karlen, MD                      Phoenix, AZ, USA</p>	
7:30 PM	<b>Adjourn</b>		

continued

# Howard H. Steel CONFERENCE on Pediatric Spinal Cord Injury/Dysfunction

Time	Topic/Title	Presenter (s)	Moderator
<b>Monday December 16, 2024 • CONFERENCE</b>			
<b>LOCATION: Trailblazers D/E</b>			
7:30 AM-8:30 AM	<b>Registration and Continental Breakfast</b>		
8:30 AM-9.15 AM	<b>The Newton C. McCollough Lecture</b> <b>Introduction</b> <b>The Past, Present, and Future Landscape for Orthopaedic/Neurosurgical Management of Children and Adolescents with SCI</b>	Randal R. Betz, MD Lawrenceville, NJ, USA	Larry Vogel, MD Chicago, IL, USA
9:15 AM-10:00 AM	<b>Keynote Talk:</b> <b>Precision Medicine, Therapeutics, and Rehabilitation Engineering in Patients with Neuromuscular Disease</b>	Craig M. McDonald MD Sacramento, CA, USA	Raymond Onders, MD Cleveland, OH, USA
10:00 PM-10:10 PM	<b>Stretch Break</b>		
10:10 AM-11:10 AM	<b>Session 12:</b> <b>Course: Sports and Exercise Options for Children with Spinal Cord Injury</b>	Pamela Wilson, MD Aurora, CO, USA	<b>● Click here for Abstract</b>
11:10 AM-11:55 AM	<b>Keynote:</b> <b>Inclusive Sport &amp; Recreation: My Paralympic Story, Research and More!</b>	Anjali Forber-Pratt, PhD, PLY Rockville, MD, USA	Kathryn Lucas, PT, PhD, DPT Phoenix, AZ, USA
11:55 AM	<b>Awards &amp; Final Announcements</b>	MJ Mulcahey, PhD, OTR/L Philadelphia, PA, USA	
12:10 PM	<b>Meeting Adjourned</b>		



## Topics in Spinal Cord Rehabilitation

Topics in Spinal Cord Injury Rehabilitation (TSCIR) is an interdisciplinary journal devoted to the study and dissemination of practical and theoretical information related to the subject of spinal cord injury rehabilitation.



The TSCIR Online Archive is fully indexed and includes all articles from 1997 to present.

## Award-Eligible Posters

**1** Epidemiology of Pediatric Spinal Cord Injury in Ireland, 2016 - 2025.

**Eimear Smith, MD** • *Dublin, Ireland, USA*

**2** Subthreshold TMS-Induced Supraspinal Modulation of Spinal Excitability in Children and Adolescents

**Piia Haakana, PhD Candidate** • *Helsinki, Finland*

**3** Dissemination of a Newly Revised Evidence-Based Pediatric Neurogenic Bowel Management Standard of Care (SOC)

**Louise Rudden, NP** • *Toronto CA, USA*

**4** Muscle Mass, Bone Mineral Density, And Functional Outcome Scores in Children with Spinal Cord Injuries

**Isabella Ferrara** • *Baltimore, MD, USA*

**5** Noninvasive Spinal Stimulation with Activity-Based Training to Improve Trunk Control in Children with Spinal Cord Injury

**MacKenzie Goode-Roberts, PT, DPT** • *Louisville, KY, USA*

**6** Emergency Department Visits for Children with Spinal Cord Injury: Reasons for Visits and Associated Hospitalization

**Jennifer Thompson, MD** • *Louisville, KY, USA*

## Posters

**7** Mobile Arm Supports: Bridging Recovery-Based Therapy and Community Engagement for Arm and Hand Function

**Kathryn Eaton, MSOT, OTR/L** • *Louisville, KY, USA*

**8** A Case Series Report on Recovery of Motor Function and Mobility Following Spinal Cord Decompression in Severe Congenital Spinal Deformity with Pre-Operative Myelopathy

**Kimberly Scharff, PT, DPT, PCS** • *Philadelphia, PA, USA*

**9** Restoration Of Upper Extremity Function Post Nerve Transfers in Children with Acute Flaccid Myelitis (AFM)

**Alaena McCool, MS, OTR/L, CPAM** • *Severna Park, MD, USA*

**10** Case Study – A Confounding Pediatric Spinal Cord Injury: Anterior, Central, Or Both?

**Mara Martinez-Santori, MD, MS** • *Houston, TX, USA*

**11** Paediatric Spinal Cord Injury and Long-Term Social Outcomes

**Richa Kulshrestha, MRCPCH** • *Gobowen, England*

**12** Use Of Lower Extremity Braces with Activity Based Restorative Therapy

**Elizabeth Williams, PT, DPT, MS** • *Baltimore, MD, USA*

**13** Multiple Lumbosacral Radiculopathies Following Craniospinal Radiation in a 13-Year-Old

**Melanie White, DO** • *Rochester, MN, USA*

**14** A New Horizon for OT And PT Practice: Treatment of An Infant with Prenatal Repair of Myelomeningocele

**Matthew Davis, PT, DPT, ATP** • *Louisville, KY, USA*

**15** Case Report: Rehabilitation Interventions in a 15-Year-Old Male with Transverse Myelitis

**Charlotte Davis** • *London, UK*

**Dr. Jan Gawronski FRCP** • *London, UK*

## Late Breaking Posters

**16** Assessing Community Needs of Individuals with Spina Bifida and Their Families

**Ava S. Jefson** • *Chicago, IL, USA*

**17** Identifying Preventive and Corrective Seating Strategies for Secondary Neuromuscular Scoliosis in Children: A Scoping Review

**Selina Mendieta Morgan, PT, DPT, NCS** • *San Antonio, TX, USA*

**18** Revision Of the International Spinal Cord Injury (SCI) Urinary Tract Infection (UTI) Basic Data Set: Applications in Pediatric SCI

**Suzanne Groah, MD, MSPH** • *Washington DC, USA*

**19** **Withdrawn**

**20** Hip Joint Status of a Childhood Spinal Cord Injured Population

**Kirsten Hart, MSc** • *Aylesbury, Bucks, UK*

**21** A Review of Childhood Onset Spinal Cord Injury Born 1930-1964

**Kirsten Hart, MSc** • *Aylesbury, Bucks, UK*

continued



# Howard H. Steel CONFERENCE on Pediatric Spinal Cord Injury/Dysfunction

## Late Breaking Posters

**22** Predicting Severity of Pediatric Spinal Cord Injuries Using Structural MRI Measures and Deep Learning: A Comprehensive Analysis Across All Vertebral Levels

**Laura Krisa, PhD** • Mount Laurel, NJ, USA

**23** Perinatal Spinal Cord Injury: A Qualitative Study Exploring Parent Perspectives, Clinical Presentations and Health Challenges

**Heba Kourahbi** • Louisville, KY, USA

**24** Development of a Longitudinal Survey for Youth with Spina Bifida and their Caregiver

**Margaux Linde, BS** • Rochester, MN, USA

**25** Epidemiology of Spinal Cord Injury in Pediatric Patients at the Institut Guttmann in Barcelona: Analysis of Temporal Trends Over the Last 20 Years (2003-2023)

**Claudia Teixidó** • Barcelona, Spain

**26** Autologous Bone Marrow Derived Biologics with Mesenchymal Stem Cells Maintained in their Native Stroma are Effective in Relieving Pain and Regenerating Hyaline Cartilage in a Nude Rat Osteoarthritis Model

**Jeff Donner, MD** • Johnstown, CO, USA

**27** Case Report of the Successful Treatment of Neuropathic Pain Using 20-Year-Old Male who Sustained a Traumatic T10 Spinal Cord Injury Using Autologous Bone Marrow Derived Biologics with Mesenchymal Stem Cells Maintained in their Native Stroma

**Jeff Donner, MD** • Johnstown, CO, USA



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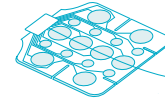
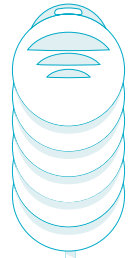


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Our funding is dedicated to supporting both programs and scientific research to improve the quality of life for those affected by and living with spinal cord injury.



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