### The National Institutes of Health

**Pediatric Concussion Workshop**

Bethesda North Marriott Hotel & Conference Center  
October 13-14, 2016

**Day 1: October 13, 2016**

7:30 am  **Registration**

8:00 am  **Welcome**  
_Walter Koroshetz, MD, NIH/NINDS_

8:15 am  **Patient Perspective**  
_Victoria (Tori) Bellucci, Student and former All-Met High School Soccer Player_

8:25 am  **Summary of IOM Report**  
_Fred Rivara, MD, Seattle Children's Research Institute_

8:55 am  **Session I: What Is a Concussion?**  
_Moderator: Ramona Hicks, PhD, One Mind for Research_  
20 min presentations and 40 min Panel Q&A Session  
- **Terminology – Semantics of Concussion**  
  _Jonathan Mink, MD, PhD, University of Rochester_  
- **Incidence & Prevalence – Surveillance System**  
  _Dawn Comstock, PhD, Colorado School of Public Health_  
- **Biomechanics – biosensors, strain, measurement of dosing**  
  _Susan Margulies, PhD, University of Pennsylvania_

10:00 am  **Break** (15 minutes)  
- **Symptoms, Pathology and Heterogeneity -- Sub-Acute Symptoms, Post-Concussion Syndrome**  
  _Harvey Levin, PhD, Baylor College of Medicine_  
- **Biology of Concussion: Diffuse Axonal Injury, Energy Crisis, and Autonomic Function**  
  _Douglas Smith, MD, University of Pennsylvania_

11:00 am  **Panel Discussion**

11:45 am  **Lunch** (1 hour)

12:45 pm  **Session II: Developmental Considerations for Studying Concussion in Youth**  
_Moderator: Ruth Brenner, MD, MPH, NIH/NICHD_  
15 min presentations and 15 min Panel Q&A Session  
- **Neurodevelopment & Connectivity**  
  _Jay Giedd, MD, University of California, San Diego_  
- **Cognitive Development**  
  _Robert Asarnow, PhD, University of California, Los Angeles_  
- **Psychosocial & Mood Development**  
  _Grant Iverson, PhD, Harvard Medical School_  
- **Methods for Assessing Changes in Developmental Trajectory**  
  _Linda Ewing-Cobbs, PhD, University of Texas Health Science Center, Houston_

1:50 pm  **Panel Discussion**
2:05 pm  **Break** (15 min)

2:20 pm  **Session III: Diagnostic Markers of Concussion in Children**

Moderator: Mary Ellen Michel, PhD, NIH/NICHD/NCMRR

15 min presentations and 15 min Panel Q&A Session

- Symptom Presentation by Age – How Do Kids Describe Concussion?
  *Gerry Gioia, PhD, Children’s National Health System*

- Age-Appropriate Assessment Tools
  *Keith Yeates, PhD, University of Calgary*

- The Potential of Age-Appropriate Biofluid Imaging
  *Christopher Giza, MD, University of California, Los Angeles*

- Devices and the Effect of Developmental Trajectory
  *Uzma Samadani, MD, PhD, University of Minnesota*

3:25 pm  **Panel Discussion**

3:40 pm  **Break** (15 min)

3:55 pm  **Session IV: Prognostic Markers of Concussion in Children**

Moderator: Patrick Bellgowan, PhD, NIH/NINDS

15 min presentations and 15 min Panel Q&A Session

- Dosing of Head Hits and Prior Concussions
  *Stefan Duma, PhD, Virginia Tech*

- Predictive markers for persistent post-concussion symptoms
  *Roger Zemek, MD, Children’s Hospital of Eastern Ontario*

- Prognostic Biomarkers and Genetic Markers
  *Rebekah Mannix, MD, MPH, Boston Children’s Hospital*

- Sex Differences
  *Tracey Covassin, PhD, Michigan State University*

5:00 pm  **Panel Discussion**

5:30 pm  **Adjourn**

**Day 2: October 14, 2016**

8:00 am  **Summary of Day 1**

*Jonathan Mink, MD, PhD, University of Rochester*

8:30 am  **Patient Advocacy Perspective**

*Robert Gfeller, Executive Director, Childress Institute for Pediatric Trauma*

9:00 am  **Session V: Acute Management of Concussion**

Moderator: Valerie Maholmes, PhD, NIH/NICHD/PTCIB

15 min presentations and 15 min Panel Q&A Session

- Point of Injury Identification
  *Christina Master, MD, The Children’s Hospital of Philadelphia*

- General Management of Acute Concussion
  *Stacey Suskauer, MD, Kennedy Krieger Institute*

- Risk Management / Second Impact Syndrome
  *Kevin Guskiewicz, PhD, University of North Carolina*

- What Is “Rest”?
  *Bill Meehan, MD, The Micheli Center for Sports Injury Prevention*
10:10 am  **Panel Discussion**

10:25 am  **Break (15 min)**

10:40 am  **Session VI: Management of Persistent Concussion Symptoms**  
**Moderator:** Alison Cernich, PhD, NIH/NICHD/NCMRR  
15 min presentations and 15 min Panel Q&A Session

- Differential Diagnosis of Post-concussion Symptoms  
  *Howard Goodkin, MD, PhD, University of Virginia*
- Symptom-based Treatments  
  *Isabelle Gagnon, PhD, McGill University*
- Role of Schools and Academic Accommodation  
  *Karen McAvoy, PsyD, Rocky Mountain Hospital for Children*
- Decisions Regarding RTP Following Repeat Injury  
  *Gary Solomon, PhD, Vanderbilt University*
- Multidisciplinary Approach to Treatment  
  *Michael McCrea, PhD, Medical College of Wisconsin*

12:00 pm  **Panel Discussion**

12:15 pm  **Lunch (1 hour)**

1:15 pm  **Session VII: Leveraging Existing Resources**  
**Moderator:** Patrick Bellgowan, PhD, NIH/NINDS  
10 min presentations and 5 min Q&A Session

- DoD/NCAA CARE Consortium  
  *Thomas McAllister, MD, Indiana University School of Medicine*
- NIH’s Adolescent Brain Cognitive Development (ABCD) Study  
  *Susan Weiss, PhD, NIH/NIDA*
- NIH’s TRACK-TBI Pediatrics (Pediatric CDE development)  
  *Tina Duhaime, MD, Massachusetts General Hospital*
- CDC’s Concussion Surveillance Program  
  *Matt Breiding, PhD, CDC/Division of Unintentional Injury Prevention*

2:20 pm  **Transition to Breakout Groups**

2:30 pm  **Session VIII: Prioritization of Research Needs: Breakout Sessions**  
Closed Session

4:00 pm  **Transition Back to Main Conference Room (White Flint Amphitheater)**

4:15 pm  **Session IX: Prioritization of Research Needs: Breakout Sessions Report Back**

5:00 pm  **Summary & Closing**  
*Jonathan Mink, MD, PhD, University of Rochester Medical Center*  
*Walter Koroshetz, MD, NIH/NINDS*

5:30 pm  **Adjourn**