

## Executive Summary

### Building Evidence with Clinical Trials

2020-21 was a pivotal year for clinical trials in the UPMC Sports Medicine Concussion Program. We concluded the first-ever randomized controlled trial (RCT) of precision vestibular therapy in adolescents following concussion funded by the Chuck Noll Foundation for Brain Injury Research. We also began the second year of two RCTs, including one in partnership with UPMC Children’s Hospital of Pittsburgh and the Medical College of Wisconsin examining early, Active Injury Management (AIM) for concussion in at-risk pediatric patients, and another focused on Targeted Rehabilitation Exercises for Vestibular (T-REV) impairment in civilians and military personnel following concussion. We also received funding and began enrollment of military-aged civilian patients into the Targeted Multidomain (T-MD) RCT, a multisite study that assesses the effectiveness of multiple, targeted concussion treatments simultaneously. Overall, we will enroll a combined 1000+ patients across 4 years into these trials that will help set the standard for concussion clinical practice guidelines.

### Publishing Impactful Clinical Research

Our program faculty published over 40 peer-review papers in high impact journals including 20 first author and 22 senior author papers. Our work appeared in prestigious journals including *JAMA Neurology*, *Pediatrics*, *American Journal of Sports Medicine*, and *Neurosurgery*. Highlights included a study providing evidence for the benefits of early specialty care following concussion ([see JAMA Neurology](#)) and research supporting a new Concussion Clinical Profiles Screening tool (CP-Screen) ([see Neurosurgery](#)).

### Expanding the Concussion Research Laboratory

With the continued generous support of the Pittsburgh Steelers and the Rooney family, we were able to expand the Concussion Research Laboratory to include a new functional near-infrared spectroscopy (fNIRS) imaging suite, exertional testing equipment, and video oculography goggles. This state-of-the-art facility and its 6 full time research staff and post-doctoral research fellow are located at the Rivertech office park on South Water Street in Pittsburgh’s Southside neighborhood.

### Inaugural Dan Rooney Concussion Fellow

UPMC and the Royal College of Surgeons Ireland (RCSI) University of Medicine and Health Sciences will oversee the new Dan Rooney Concussion Fellow beginning in fall 2021. The fellow will train in residence at UPMC in Pittsburgh with Drs. Michael “Micky” Collins and Anthony Kontos and will then return to Ireland to develop and grow the UPMC Concussion Network’s clinical research program in conjunction with a research coordinator and the RCSI.

## Research Grants (Ongoing)

### Chuck Noll Foundation for Brain Injury Research (0011)

Title: Saliva biomarkers to predict pediatric concussion subtypes (**Kontos AP, Collins MW**, Master T- M-PIs)  
Dates: February 2021-January 2023

### National Collegiate Athletic Association/Department of Defense Grand Alliance (W81XWH-BAA-14-1)

Title: NCAA/DoD Grand Alliance: Concussion Assessment, Research and Education (CARE) Consortium - Longitudinal Clinical Study Core (McAllister T, Broglio S, McCrea M- M-PIs; **Kontos AP, Collins MW**- Site Co-PIs)  
Dates: August 2014-February 2021

### National Institutes of Health/National Institute of Mental Health R01 Award (1R01MH114881-01)

Title: Emotion Regulation Circuitries in Youth with Mild Traumatic Brain Injury. (**Kontos AP**, Versace A- M-PIs).  
Dates: January 2018-December 2022

### US Army Medical Research and Development Command CDMRP Fiscal Year 2017 Psychological Health and TBI Research Program Complex TBI Rehabilitation Research-Clinical Trial Award (W81XWH-17-CTRR-CTA)

Title: Randomized Controlled Trial of a Precision Vestibular Rehabilitation in Military Personnel with mTBI (**Kontos AP**, Sparto P- M-PIs).  
Dates: September 2018-August 2022

### CDC Research on Improving Pediatric mTBI Outcomes Through Clinician Training, Decision Support, and Discharge Instructions U01 Award (U01CE002944-01)

Title: Active Injury Management (AIM) after Pediatric Concussion (Thomas D, **Kontos AP**- M-PIs).  
Dates: September 2018-August 2022

### National Football League Scientific Advisory Board – Innovative Translational Research on Concussion and Comorbid Conditions

Title: Prevalence of Brain Health versus Neurodegeneration in Professional Football Retirees (Okonkwo DO, Lopez O, **Collins MW, Kontos AP**, Mountz J- M-PIs)  
Dates: November 2018-October 2022

### Chuck Noll Foundation for Brain Injury Research (0001)

Title: Toward the identification of saliva biomarkers predicting the clinical course and outcome of adolescents with mild traumatic injury (Versace A- PI)  
Dates: February 2019-January 2021

### Uniformed Services University of the Health Sciences- through Henry Jackson Foundation- Transforming Technology for the Warfighter Program (Department of Defense)

Title: Rapid objective analysis of impairment and recovery from mild traumatic brain injury (Balaban C, **Kontos AP**, Hoffer M- M-PIs).  
Dates: December 2020-November 2023

### US Army Medical Research and Development Command CDMRP Fiscal Year 2019 Psychological Health and TBI Research Program Joint-Program Committee 8/Clinical and Rehabilitative Medicine Research Program Rehabilitation Research-Clinical Trial Award (W81XWH2010745)

Title: Multisite Randomized Controlled Trial of Targeted Multidomain (T-MD) Interventions for Complex mTBI (**Kontos AP**, Okonkwo DO, **Collins MW**- M-PIs).  
Dates: September 2020-August 2023

## Publications (sample)

1. **Kontos AP**, Kaminski T, **Eagle SR**, Putukian M, Kirkendall D, Chiampas G. Concussions in U.S. youth soccer players: Results from the U.S. Soccer online concussion survey. *Sci & Med in Football*; 2020: Epub ahead of print.
2. **Kontos AP**, Elbin RJ, **Trbovich A**, Womble M, Said A, **Fazio-Sumrok V**, **French J**, **Kegel N**, **Puskar A**, **Sherry N**, **Holland CL**, **Collins MW**. Concussion Clinical Profiles Screening (CP Screen) tool: Preliminary evidence to inform a multidisciplinary approach. *Neurosurg*; 2020; 87(2): 348-356.
3. Whitney SL, **Eagle SR**, Marchetti G, **Mucha A**, **Collins MW**, **Kontos AP**. Association of acute Vestibular/Ocular Motor Screening (VOMS) scores to prolonged recovery in collegiate athletes following sport-related concussion. *Brain Inj*; 2020; 34(6):840-845.
4. **Eagle SR**, Puligilla A, **Fazio-Sumrok V**, **Kegel N**, **Collins MW**, **Kontos AP**. Time to initial clinic visit predicts prolonged recovery in pediatric patients with concussion. *J Neurosurg- Peds*; 2020; Epub ahead of print.
5. **Kontos AP**, Jorgensen-Wagers K, **Trbovic AM**, **Ernst N**, **Emami K**, **Gillie B**, **French J**, **Holland CL**, Elbin RJ, **Collins MW**. Timing is everything: Effect of time since injury to first clinic visit on recovery following concussion. *JAMA Neurol*; 2020; 77(4); 435-440.
6. **Eagle SR**, Womble MN, Elbin RJ, **Pan R**, **Collins MW**, **Kontos AP**. Concussion symptom cut-offs for identification and prognosis of sport-related concussion: The role of time since injury. *Am J Sports Med*; 2020; 8(10): 2544-2551

7. **Sinnott AM, Kontos AP, Collins MW, Ortega JD.** Concussion symptoms among athletes: pre-injury factors predict post-injury factors. *J Head Traum Rehab*; 2020; 35(4): E361-E371.
8. **Galey J, Eagle SR, Blaney N, Holland CL, Bitzer H, Schneider W, Okonkwo DO, Mucha A, Collins MW, Kontos AP.** Effect of patient compliance with treatment recommendations on clinical outcomes in chronic mTBI: A TEAM-TBI study. *Mil Med*; 2020; 185(7-8): E1229-E1234.
9. **Ernst N, Schatz P, Trbovich AM, Emami K, Eagle SR, Mucha A, Collins MW, Kontos AP.** Utility of one versus multiple measurements of near point of convergence (NPC) following concussion. *J Ath Train*; 2020; 55(8):850-855.
10. **Kowalczyk CL, Eagle SR, Holland CL, Collins MW, Kontos AP.** Average symptom severity and related predictors of prolonged recovery in pediatric patients with concussion. *Appl Neuropsychol Child*; 2020; Jun 9:1-5.
11. **French J, Jennings S, Eagle SR, Collins MW, Kontos AP.** A within-subjects comparison of clinical outcomes for patients' first and second concussion *J Head Traum Rehab*; in press.
12. **Eagle SR, Kontos AP, Collins MW, Connaboy C, Flanagan S.** Network analysis of sport-related concussion research during the past decade (2010-2019). *J Athl Train*; 2020; Epub ahead of print.
13. **Brustman K, Eagle SR, Mucha A, Trbovich A, Collins MW, Kontos AP.** Association of sleep symptoms with mood and vestibular subtypes following sport-related concussion. *Appl Neuropsych Child*; 2020; Jul 16:1-5.
14. **Gillie BL, Fazio-Sumrok V, Eagle SR, Kegel N, Trbovich AM, Collins MW, Kontos AP.** Clinical predictors of post injury anxiety in adolescent patients following concussion. *Appl Neuropsychol Child*; 2020; Epub ahead of print.
15. **Kontos AP, Monti K, Eagle SR, Thomasma E, Holland CL, Thomas D, Bitzer HB, Mucha A, Collins MW.** Test-retest reliability of the Vestibular Ocular Motor Screening (VOMS) and modified Balance Error Scoring System (mBESS) in U.S. military personnel. *J Sci Med Sport*; 2020; Epub ahead of print.