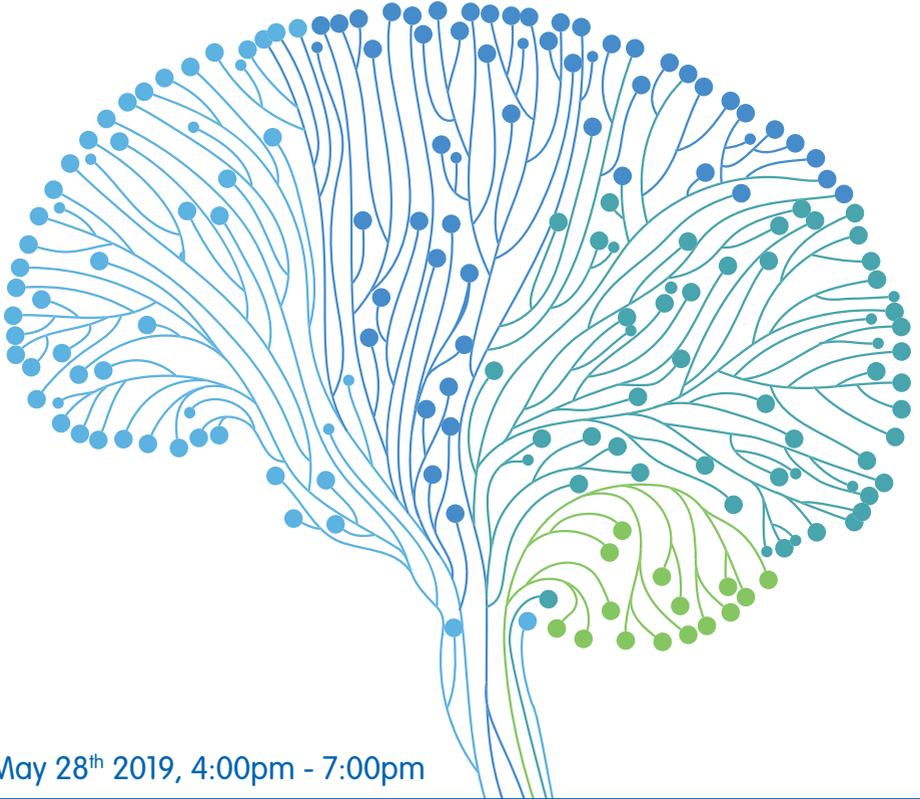


ACSM'S 66TH ANNUAL MEETING, ORLANDO, USA

Hydration For Health Preconference



May 28th 2019, 4:00pm - 7:00pm

ORANGE COUNTY CONVENTION CENTER,
ROOM 205



**DANONE
NUTRICIA**
RESEARCH

**HYDRATION
FOR HEALTH**



Agenda



PART 1

Session on the latest advancements on the role of hydration and physical activities on cognitive performance in children and adults

Chairman Stavros Kavouras, PhD, FACSM, FECSS, Arizona State University, USA

Childhood Physical Activity Effects on Brain & Cognition
Charles H. Hillman, PhD, Northeastern University, USA

The effect of hydration on cognition in children: results from the WITkids intervention
Naiman Khan, PhD, RD, University of Illinois at Urbana-Champaign, USA

Effects of Exercise on Memory Function among Adults
Paul D. Loprinzi, PhD, University of Mississippi, USA

Dehydration and cognitive performance in adults: results of a meta-analysis
Mindy Millard-Stafford, PhD, FACSM, Georgia Institute of Technology, USA

Q&A

Break. Light snacks and beverages will be served

PART 2

“Pitch your Science !” contest

Selected candidates will have 3 minutes to pitch their research and the audience will vote for the winner. The award session will close the preconference.

Stavros A. Kavouras, PhD, FACSM, FECSS,

Professor of Nutrition & Director, Hydration Science Lab, Arizona State University, USA

Dr. Stavros Kavouras is a Professor of Nutrition at Arizona State University and Director of the Hydration Science Lab. His Lab is studying the mechanisms by which water intake impacts health and performance. His current research is focusing on the effect of water intake on glucose regulation and its implication on children’s hydration and obesity. Dr. Kavouras is the author of more than 130 peer review articles, 6,200 citations (h-index 41), and he has given lectures in 29 countries. He is a section Editor of the European Journal of Nutrition, Associate Editor of Behavioral Medicine and Frontiers in Nutrition. Dr Kavouras is a Fellow of the American College of Sports Medicine & the European College of Sports Science as well as elected member of the American Society of Nutrition, the Obesity Society, and the American Physiological Society.



Charles H. Hillman, PhD

Associate Director of the Center for Cognitive & Brain Health
Department of Psychology, Department of Physical Therapy, Movement & Rehabilitation Sciences, Northeastern University, USA

Dr. Charles Hillman began his career in 2000 at the University of Illinois, where he was a Professor in the Department of Kinesiology and Community Health. He continued his career in 2016 at Northeastern University, where he holds appointments in the Department of Psychology and the Department of Physical Therapy, Movement, and Rehabilitation Sciences. Dr. Hillman has more than 200 publications and 11 book chapters on physical activity and brain health. His work has been funded by the National Institutes of Health and several private sponsors. He served as a member of the 2018 Physical Activity Guidelines for American's Scientific Advisory Committee.

Childhood Physical Activity Effects on Brain & Cognition

There is a growing public health burden of unhealthy behaviors (e.g., physical inactivity, excessive energy intake) among children of industrialized nations. Children have become increasingly inactive, leading to concomitant increases in the prevalence of being overweight and unfit. Poor physical activity behaviors during childhood often track throughout life and have implications for the prevalence of several chronic diseases during adulthood. Particularly troubling is the absence of public health concern for the effect of physical inactivity on cognitive and brain health. It is curious that this has not emerged as a larger societal issue, given its clear relation to childhood obesity and other health disorders that have captured public attention. My research program has investigated the relation of health behaviors (e.g., physical activity, exercise) and their related physiological correlates (e.g., aerobic fitness, adiposity) to cognitive and brain health in preadolescent children. My techniques of investigation involve a combination of neuroimaging, behavioral assessments, and scholastic outcomes in an effort to translate basic laboratory findings into everyday life. Central to this translational approach is the identification neural networks that are susceptible to health interventions. As such, the overarching goal of my research is to determine factors that improve cognition, maximize brain health, and promote the effective functioning of individuals as they progress through the lifespan. Findings from my studies have indicated that greater aerobic fitness and healthy body mass are positively related to brain structure and function, cognition, and scholastic achievement. Such discoveries are timely and important for public health concerns related to chronic disease prevention as a function of childhood inactivity and obesity. These findings link pervasive societal concerns with brain health and cognition, and have implications for the educational environment and the context of learning.



Naiman Khan, PhD, RD

Assistant Professor,
University of Illinois at Urbana-Champaign, USA

Dr. Khan's research has taken a multidisciplinary approach to integrate knowledge in the disciplines of nutrition and cognitive neuroscience to understand the influence of foods and nutrients on specific aspects of attention, memory, and achievement. He has appointments in the units of Kinesiology and Community Health, Nutritional Sciences, Neuroscience, and the Family Resiliency Center at the University of Illinois at Urbana-Champaign. He has extensive training and research experience in nutritional science, body composition, and cognitive neuroscience. His work has focused on the relation of health behaviors of nutrition and physical activity and their physiological correlates of adiposity and aerobic fitness on measures of brain function and cognitive health among pediatric populations. Ongoing research trials in his laboratory include randomized-controlled trials testing the efficacy of acute and long-term physical activity and nutrition interventions for improving children's ability for cognitive control and relational memory, processes that are foundational to learning and achievement. Specifically, Dr. Khan is interested in elucidating the influence of specific dietary components (e.g., water, fiber, and carotenoids) and cognitive function in children. The overarching objective of his research program is to generate foundational knowledge in nutritional neuroscience by translating the impact of health behaviors to childhood cognitive function and brain health.

The effect of hydration on cognition in children: results from the WITkids intervention

Naiman A. Khan, Daniel R. Westfall, Alicia R. Jones, Macie A. Sinn, Jeanne H. Bottin, Erica T. Perrier, Charles H. Hillman

Background: Previous work in adults suggests that dehydration has negative effects on cognition. However, the effect of hydration on cognitive function remain understudied in children. This is concerning since a large proportion of US children exhibit highly concentrated urine, suggestive of insufficient hydration.

Objective: To determine the effects of daily water intake on urinary markers of hydration and cognitive control among school-aged children.

Design: 9-11-year-olds (N=82) completed a three-intervention crossover intervention where they were asked to either maintain their water intake (ad libitum) or consume High [2.5L/d] or Low [0.5L/d] water for 4 consecutive days. Following the interventions, cognitive control tasks requiring inhibition, working memory, and cognitive flexibility were assessed using a modified flanker, Go/NoGo, and color-shape switch tasks. During day 4, children collected their urine over 24hours for color, specific gravity (USG), and osmolality assessment.

Results: Hydration differed significantly between interventions. Urine color during the Low intervention was significantly higher than ad libitum and both were significantly greater than High intervention (Low: 6 [median] and 2 [iqr], ad libitum: 5 [median] and 2 [iqr], High: 3 [median] and 0 [iqr], all $P \leq 0.01$). Similar intervention effects were observed for osmolality (Low: 912 ± 199 , ad libitum 790 ± 257.0 , High 260 ± 115 mOsmol/kg, all $P < 0.001$) and USG (Low: 1.023 ± 0.005 , ad libitum 1.020 ± 0.007 , High 1.005 ± 0.004 , all $P < 0.001$). Ad libitum hydration was positively related to switch task performance. Benefits of the High intervention were observed during the switch task whereby participants exhibited lower working memory cost relative to the Low intervention. No significant changes in cognition were observed for the flanker and Go/NoGo tasks.

Conclusions: Children with better habitual hydration exhibited superior performance during the cognitive flexibility task. Additionally, the 4d water intervention resulted in significant changes in urinary markers of hydration and had selective benefits during task switching.



Paul D. Loprinzi, PhD

Associate Professor, Exercise & Memory Laboratory,
University of Mississippi, USA

Dr. Paul Loprinzi is an Associate Professor in the Department of Health, Exercise Science and Recreation Management at the University of Mississippi. He is the director of the Exercise & Memory laboratory and has published over 450 research articles related to exercise on cardiometabolic, psychological and cognitive health. His laboratory is dedicated to evaluating the effects and mechanisms of acute and chronic exercise on various memory systems.

Effects of Exercise on Memory Function among Adults

An overview of the effects of acute and chronic exercise on memory function will be discussed. This will involve a discussion on several memory systems, including episodic memory, implicit memory, and prospective memory. These relationships will be discussed across various adult populations, including young adults, healthy older adults and those with mild cognitive impairment. Further, mechanisms through which acute and chronic exercise influence memory will be discussed. Lastly, recommendations for future work will be highlighted.



Mindy Millard-Stafford, PhD, FACS

Full Professor, School of Biological Sciences,
Georgia Institute of Technology, USA

Mindy Millard-Stafford, PhD, is Full Professor in Biological Sciences, former Associate Chair in the School of Applied Physiology at Georgia Institute of Technology where she has directed/co-directed the Exercise Physiology Laboratory for over 30 years. Her research has primarily focused on thermoregulation and fluid replacement during exercise in the heat and appropriate countermeasures to fatigue. She has served on scientific review panels for the American Cancer Society, Centers for Disease Control and Prevention, Department of Defense Military Health and Medical Research Program, American Institute for Biological Sciences, the NCAA Competitive Safeguards and Medical Aspects of Sports Committee, and the Institute of Medicine. She was inducted as Fellow into the National Academy of Kinesiology in 2003 and the American College of Sports Medicine in 1992. She serves on the Editorial Boards for International Journal of Sports Nutrition and Exercise Metabolism, Frontiers of Nutrition, and Journal of Strength and Conditioning Research. Dr. Millard-Stafford is a Past-President of the Southeastern Chapter of the American College of Sports Medicine and Past-President of the American College of Sports Medicine (the 52nd President and 5th woman to serve in this role in 2008-2009). She currently serves on the Executive Board as Member-at-Large for the National Academy of Kinesiology and as a Trustee for the Georgia Tech Athletic Association Board.

Dehydration and cognitive performance: results of a meta-analysis

Hypohydration (body water deficit) has adverse health consequences and diminishes exercise capacity, particularly in a thermally challenging environment. Research also suggests adverse effects of dehydration on mental performance in healthy adults, although individual study results often appear in conflict. The reason for such heterogeneity in findings (and, thus, the inability to draw definitive conclusions) is due to the different methods used to induce dehydration, the range of cognitive tests utilized, and the magnitude of dehydration elicited in the various research protocols. The interaction effects that acute heat exposure (detrimental) and exercise (beneficial up to 20 min post-exercise if not performed to exhaustion) exert on some cognitive test performance variables also factor into the disparity in findings among studies. Using meta-analysis, the effect size of hypohydration on cognitive task performance was reported as small but significant (Wittbrodt & Millard-Stafford, Med Sci Sports Exerc 50:2360, 2018) across 33 studies on healthy adults. However, reaction time was less sensitive to hypohydration compared to the accuracy in completing cognitive tasks, especially those involving executive function, attention, and motor coordination. The methods of dehydration used (exercise with or without heat, fluid restriction) did not influence the effect when compared to a control rest condition. As anticipated, there was a significant association between the magnitude of dehydration and decrements in cognitive performance. Whether a critical “threshold” of dehydration exists remains to be investigated, particularly if exercise models of dehydration are compared to when fluid is replaced during exercise (as the control condition).

Hydration for Health is a community dedicated to promoting healthy hydration as an easy and scientifically robust game changer for a better health. It catalyzes pioneering scientific research and provides simple solutions for people to be healthily and adequately hydrated.

Join us to make healthy hydration the new norm!

DON'T MISS OUT ON THE 11TH HYDRATION FOR HEALTH CONFERENCE!

June 25th-26th, 2019 - Evian, France



Scientific conference highlights:

- Hydration and glucose regulation
- Water resources and health
- Hydration and behavior change
- "Pitch your science!" contest and young researcher award

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