

SHS Faculty Scholarship

Tamara Hew-Butler, DPM, PhD, FACSM

Program: Exercise Science

PEER-REVIEWED JOURNAL PUBLICATIONS

- 1) Rosner MH and **Hew-Butler T**. Exercise-Associated Hyponatremia. In: UpToDate, Rose BD (Ed), UpToDate, Waltham, MA, 2016.
- 2) Cairns RS and **Hew-Butler T**. Transient hyponatremia precedes and augments exertional rhabdomyolysis. *Eur J Appl Physiol*. 2016 Mar;116(3):647-55. doi: 10.1007/s00421-015-3324-4.
- 3) **Hew-Butler T**, EAH Consensus Group. Inadequate hydration or normal fluid homeostasis? *Am J Public Health*, online ahead of print August 13, 2015 e1-e2.
- 4) **Hew-Butler T**, Rosner MH, Fowkes-Godek S, Dugas JP, Hoffman MD, Lewis DP, Maughan RJ, Miller KC, Montain SJ, Rehrer NJ, Roberts WO, Rogers IR, Siegel AJ, Stuenkel KJ, Winger JM, Verbalis JG. Statement of the Third International Exercise-Associated Hyponatremia Consensus Development Conference, Carlsbad, CA, 2015. *Clin J Sports Med* 2015; 25(4):303-320 and *Br J Sport Med* 2015;0:1–15. doi:10.1136/bjsports-2015-095004
- 5) Byrd B, **Hew-Butler T**, Martin JJ. The Effects of a Running Intervention on the Physical Self-Concept of Novice Female Runners. *Women in Sport and Physical Activity Journal* 2015 in press
- 6) **Hew-Butler T**, Landis-Piwowar K, Byrd G, Seimer M, Seigneurie N, Byrd B, Muzik O. Plasma irisin in runners and nonrunners: no favorable metabolic associations in humans. *Physiol Rep*. 2015 Jan 19;3(1). pii: e12262. doi: 10.14814/phy2.12262. Print 2015 Jan 1.
- 7) Nolte HW, **Hew-Butler T**, Noakes TD, Duvénhage C. Fatal exertional heatstroke with hyponatremic encephalopathy. *Phys Sportsmed*. 2015 Jan 14:1-6. [Epub ahead of print]
- 8) **Hew-Butler T**, Hoxha BT, Fogard K, Stuenkel KJ, Hoffman MD. Comparison of body composition before and after a 160km race using dual energy x-ray absorptiometry, bioimpedance spectroscopy and bioelectrical impedance analyses. *Int J Sports Med* 2014 Oct 6. [Epub ahead of print]
- 9) Cairns RS and **Hew-Butler T**. Incidence of Exercise-Associated Hyponatremia and its Association with Non-Osmotic Stimuli of Arginine Vasopressin in the GNW100s ultraendurance marathon. *Clin J Sport Med* 2014 Oct 14. [Epub ahead of print].
- 10) **Hew-Butler T**, Hummel J, Rider BC, Verbalis JG. Characterization of the Vasopressin 2 receptor on fluid balance and performance. *Am J Physiol Regul Integr Comp Physiol*. 2014 Aug 15;307(4):R366-75. doi: 10.1152/ajpregu.00120.2014. Epub 2014 Jun 18.
- 11) Rider BC, Coughlin A, **Hew-Butler T**, Darr K, Goslin BR. Effect of Compression Stockings on Physiological Responses and Running Performance in Division III Collegiate Cross Country

Runners during a Maximal Treadmill Test. J Strength Cond Res 2014; Jun;28(6):1732-8. doi: 10.1519/JSC.0000000000000287.

- 12) Owen BE, Rogers IR, Hoffman MD, Stuempfle KJ, Lewis DL, Fogard K, Verbalis JG, **Hew-Butler T**. Efficacy of oral versus intravenous hypertonic saline in runners with hyponatremia. J Sci Med Sport 2013; <http://dx.doi.org/10.1016/j.jsams.2013.09.001>.
- 13) Lewis DL, Owen BE, Rogers IR, Hoffman MD, Stuempfle KJ, Fogard K, Verbalis JG, **Hew-Butler T**. The Need for Salt: Does a Relationship Exist between Cystic Fibrosis and Exercise-Associated Hyponatremia? J Strength Cond Res 2013; Jul 26. [Epub ahead of print].
- 14) **Hew-Butler T**, Stuempfle KJ and Hoffman MD. Bone: an acute buffer of plasma sodium concentration during exhaustive exercise? Horm Metab Res 2013; Sep;45(10):697-700. doi: 10.1055/s-0033-1347263. Epub 2013.
- 15) Winger J, Hoffman MD, **Hew-Butler T**, Stuempfle KJ, Dugas J, Fogard K, Dugas L. Physiology and hydration beliefs change race behavior but not post-race sodium in 161km ultramarathon runners. Int J Sports Physiol Perform. 2013; Sep;8(5):536-41. Epub 2013 Feb 14.
- 16) Bennett B, **Hew-Butler T**, Hoffman MD, Rogers IR, Rosner MR. Wilderness Medicine Society Practice Guidelines for Treatment of Exercise-Associated Hyponatremia. Wilderness Environ Med. 2013. Sep;24(3):228-40. doi: 10.1016/j.wem.2013.01.011. Epub 2013 Apr 13.
- 17) Khodae M, Luyten D, **Hew-Butler T**. Exercise-Associated Hyponatremia in an Ultra-endurance Mountain Biker. Sports Health: A Multidisciplinary Approach 2013; 5(4): 334-336 originally published online 4 March 2013 doi: 10.1177/1941738113480928
- 18) Hoffman MD, **Hew-Butler T**, Stuempfle KJ. Exercise-associated hyponatremia and hydration status in 161-km ultramarathoners. Med Sci Sports Exerc 2013; Apr; 45(4):784-91. doi: 10.1249/MSS.0b013e31827985a8.
- 19) Stuempfle KJ, Hoffman MD, **Hew-Butler T**. Gastrointestinal Distress in Ultramarathoners is Associated with Race Diet. Int J Sport Nutr Exerc Metab. 2013; Apr; 23(2):103-9. Epub 2012 Sep 19.
- 20) Hoffman MD, Stuempfle KJ, Fogard K, **Hew-Butler T** Winger J, Weiss R. Urine Dipstick Analysis for Identification of Runners Susceptible to Acute Kidney Injury following an Ultramarathon. J Sports Sci. 2013; 31(1):20-31. doi: 10.1080/02640414.2012.720705. Epub 2012 Oct 4.
- 21) Hoffman MD, Fogard K, Winger J, **Hew-Butler T**, Stuempfle KJ. Characteristics of 161-km ultramarathon finishers developing exercise-associated hyponatremia. Res Sports Med. 2013; 21(2):164-75. doi: 10.1080/15438627.2012.757230.
- 22) **Hew-Butler T**, Boulter J, Bhorat R, Noakes TD. Adding insult to injury – correct management of sick female endurance athletes. SAMJ 2012; 102: 927-930.
- 23) Coler C, Hoffman MD, Towle G, **Hew-Butler T**. Hyponatremia in an 85 year old hiker: When depletion plus dilution produce delirium. Wilderness Environ Med 2012; 23: 157-157.

- 24) Hoffman MD, Ingwersen JL, Rogers IR, **Hew-Butler T** and Stuempfle KJ. Increasing Creatine Kinase Concentrations at the 161-km Western States Endurance Run. *Wilderness Environ Med* 2012; 23:56-60.
- 25) Almeida MC, **Hew-Butler T**, Soriano RN, Rao S, Wang W, Tamayo N, Oliveira DL, Nucci TB, Garami A, Bautista D, Gaava NR and Romanovsky AA. Pharmacological blockade of the cold receptor TRPM8 decreases body temperature. *J Neuroscience* 2012; 32(6):2086-2099.
- 26) Boulter J, Noakes TD and **Hew-Butler T**. Acute renal failure in four Comrades Marathon runners ingesting the same electrolyte supplement: Coincidence or causation? *SAMJ* 2011; 101(12): 876-878.
- 27) Stuempfle KS, Hoffman MD, Weschler LB, Rogers IR and **Hew-Butler T**. Race Diet of Finishers and Non-Finishers in a 100 Mile (161 km) Mountain Footrace. *J Am Coll Nutr* 2011; 30(6):529-535.
- 28) Hoffman MD, Stuempfle KJ, Rogers IR, Weschler LB and **Hew-Butler T**. Hyponatremia in the 2009 161-km Western States Endurance Run. *Int J Sports Physiol and Performance* 2012 Mar; 7(1):6-10.
- 29) **Hew-Butler T**, Hoffman MD, Stuempfle KJ, Rogers IR, Morgenthaler NG and Verbalis JG. Changes in Copeptin and bioactive vasopressin in runners with and without hyponatremia. *Clin J Sports Med* 2011; 21(3): 211-217.
- 30) Roger IR, Hook G, Stuempfle KS, Hoffman MD and **Hew-Butler T**. An intervention study of oral versus intravenous hypertonic saline administration in ultramarathon runners with exercise-associated hyponatremia: a preliminary randomised trial. *Clin J Sport Med* 2011; 21(3): 200-203.
- 31) Lee, JK, Nio AQX, Ang WH, Johnson C, Aziz AR, Lim CL and **Hew-Butler T**. First reported cases of Exercise-Associated Hyponatremia in Asia. *Int J Sports Med* 2010; 31: 1-6.
- 32) **Hew-Butler T** and Rogers IR. Reply to Dr. Watenpaugh's letter. *Wilderness and Environmental Medicine* 2010; 21(3):279.
- 33) Bruso JR, Hoffman MD, Rogers IR, Lee L, Towle G and **Hew-Butler T**. Rhabdomyolysis and hyponatremia: a cluster of five cases at the 161-km 2009 Western States Endurance Run. *Wilderness Environ Med* 2010; 21: 303-308.
- 34) **Hew-Butler T**. Arginine vasopressin, fluid balance and exercise: Is exercise-associated hyponatremia a disorder of arginine vasopressin secretion? *Sports Medicine* 2010; 40(6):459-79.
- 35) Ellis C, Cuthill J, **Hew-Butler T**, George SM and Rosner MH. Exercise-associated hyponatremia with rhabdomyolysis during endurance exercise. *Physician and Sportsmedicine* 2009; 37(1):126-32.
- 36) Rogers IR and **Hew-Butler T**. Exercise-associated hyponatremia: over zealous fluid consumption. *Wilderness Environ Med* 2009; 20(2):139-43.
- 37) Van Rooyen M, **Hew-Butler T**, Noakes TD. Drinking during marathon running in extreme heat: a video analysis study of the top finishers in the 2004 Athens Olympic marathons. *SAJSM* 2010; 22(3):55-61.

- 38) Tam N, **Hew-Butler T**, Papadopoulou E, Nolte H, Noakes TD. Fluid intake and changes in blood biochemistry, running speed and body mass during an 80km mountain trial race. *Medicina Sportiva* 2009; 13(2):108-115.
- 39) **Hew-Butler T**, Noakes TD, Soldin SJ and Verbalis JG. Acute changes in arginine vasopressin, sweat, urine and serum sodium concentrations in exercising humans: Does a coordinated homeostatic relationship exist? *Br J Sports Med* 2010; 44:710-715.
- 40) George K, Shave R, Oxborough D, Cable T, Dawson E, Artis N, Gaze D, **Hew-Butler T**, Sharwood K and Noakes T. Left ventricular wall segment motion after ultra-endurance exercise in humans assessed by myocardial speckle tracking. *Eur J Echocard* 2009; 10(2):238-43.
- 41) **Hew-Butler T**, Noakes TD, Soldin SJ and Verbalis JG. Acute Changes in Endocrine and Fluid Balance Markers during High Intensity, Steady-State and Prolonged Endurance Exercise: unexpected increases in oxytocin and brain natriuretic peptide during exercise. *Eur J Endocrinol* 2008; 159(6): 729-737.
- 42) **Hew-Butler T**, Dugas JP, Noakes TD, Verbalis JG. Changes in plasma arginine vasopressin concentrations in cyclists participating in a 109 km cycle race. *Br J Sports Med* 2010; 44(8):594-7.
- 43) **Hew-Butler T**, Siegel AJ and Noakes TD. Practical Management of Exercise-Associated Hyponatremic Encephalopathy: The Sodium Paradox of Non-Osmotic Vasopressin Secretion. *Clin J Sports Med* 2008; 18(4): 350-4.
- 44) **Hew-Butler T**, Jordaan E, Stuempfle KJ, Speedy DB, Siegel AJ, Noakes TD, Soldin SJ, Verbalis JG. Osmotic and Non-osmotic Regulation of Arginine Vasopressin during Prolonged Endurance Exercise. *J Clin Endocrin Metab* 2008; 93(6):2072-2078.
- 45) **Hew-Butler T**, Ayus JC, Kipps C, Maughan RJ, Mettler S, Meeuwisse WH, Page AJ, Reid SA, Rehrer NJ, Roberts WO, Rogers IR, Rosner MH, Siegel AJ, Speedy DB, Stuempfle KJ, Verbalis JG, Weschler LB, Wharam P. Statement of the Second International Exercise-Associated Hyponatremia Consensus Development Conference, New Zealand, 2007. *Clin J Sports Med* 2008; 18(2):111-121
- 46) Beltrami FG, **Hew-Butler T**, Noakes TD. Drinking policies and exercise-associated hyponatremia: is anyone still promoting overdrinking? *Br J Sports Med* 2008; 18(3):273-278.
- 47) **Hew-Butler T**, Boulter J, Godlonton J, Tucker R, Noakes TD. Hyponatremia and Intravenous Fluid Resuscitation in Collapsed Ultramarathon Runners. *Clin J Sports Med* 2008; 18(3): 273-8.

BOOKS, CHAPTERS

- 1) **Hew-Butler T**. *Electrolytes*. Frank C. Mooren & James S. Skinner (eds), Encyclopedia of Exercise Medicine in Health and Disease, DOI 10.1007/978-3-29807-6, Springer-Verlag Berlin Heidelberg 2011.
- 2) Rosner MH, Bennett B, **Hew-Butler T**, Hoffman MD. Exercise-Associated Hyponatremia. Hyponatremia: Evaluation and Treatment. Editor, Dr Eric Simon, Springer 2012

CONFERENCES, PRESENTATIONS, POSTERS, ABSTRACTS

PRESENTATIONS

- 1) Urine and exercise: markers of health, homeostasis and impending disease in collegiate athletes. 2nd International Conference on Urinomics and Translational Nephrology, Capricia, Portugal. September 2015.
- 2) Exercise-Associated Hyponatremia as a precursor to rhabdomyolysis, heat stroke and bone loss. 2015 CrossFit Conference on Exercise-Associated Hyponatremia, Carlsbad, CA. February 2015.
- 3) Built for Scarcity, but Living in Excess: Exercise-Associated Hyponatremia and Vasopressin Regulation during Exercise (I) (<http://bit.ly/HydrationLectures>). Hydration Lecture Series, University of Arkansas Department of Education and Health Professions, Fayetteville, AR. January 2015.
- 4) How Ultramarathons Affect the Heart, Blood, and Brain (I) (<http://sciencefriday.com/segment/08/01/2014/how-ultramarathons-affect-the-heart-blood-and-brain.html>). ScienceFriday, National Public Radio (NPR) show. August 2014.
- 5) Spectrum of Exercise-Associated Hyponatremia (I). Medicine and Science in Ultra Endurance Sports, Squaw Valley, CA. June 2014.
- 6) Exercise and Bone: a buffer for plasma sodium concentration during endurance exercise? UCSD Endocrine Grand Rounds San Diego, CA December 2013
- 7) Exercise-Associated Hyponatremia in 2-footed Running Beasts: *"Psychology versus physiology in the genesis of fluid dysregulation in exercising humans"*. Fall Sports Medicine series in the Department of Large Animal Clinical Sciences, Michigan State University October 2013
- 8) Exertional Hyponatremia: can we reconcile the existing data? American College of Sports Medicine's Annual Meeting, Indianapolis, IN June 2013
- 9) Going the Distance: Food and Fluid Intake to Optimize Performance and Minimize Disease IAU 4th Medical Conference on Ultrarunning, Steenbergen Netherlands May 2013
- 10) How to become an ACSM Fellow MWACSM Meeting, Oregon, OH Nov 2012
- 11) Hyponatremia in the Wilderness Setting: Case Studies, Current and Future Research Wilderness Medicine International Conference in Whistler, BC, Canada July 2012
- 12) Hyponatremia and Acute Renal Failure: Evidence for Causation? American College of Sports Medicine's Annual Meeting, San Francisco June 2012
- 13) Hyponatremia in marathon runners: an update American Medical Athletic Association's Annual Boston Marathon Conference April 2012
- 14) Marathon Running: Impact on water and sodium homeostasis and related endocrine functions UCSD Endocrine Grand Rounds San Diego, CA December 2011
- 15) Epidemiology, risk factors and prevention of Exercise-associated hyponatremia Wilderness Medical Society Desert Conference, Tucson, AZ November 2011
- 16) Exercise-Associated hyponatremia in distance runners Western States Endurance Run Foundation's Annual Runners Symposia, Squaw Valley, CA June 2011

- 17) Exercise-Associated hyponatremia: Dilution, depletion or a combination of both? International Olympic Committee (IOC) World Conference on prevention of Injury and Illness in Sport, Monte Carlo, Principality of Monaco, Symposium Chair April 2011
- 18) Victory, defeat and renal failure: how important is sodium balance in runners participating in a 100 mile race? Kinesiology and Nutrition Spring Departmental Symposia Series, University of Illinois, Chicago March 2011
- 19) Arginine vasopressin, fluid balance and exercise BIT's Annual World Conference of Endocrinology, Xiamen, China, January 2011

ABSTRACTS

- 1) Plasma irisin and brown fat in runners and non-runners: No favorable metabolic associations in humans (co-authors: Landis-Piowar K, Byrd G, Seimer M, Seigneurie N, Byrd B, Muzik O). ACSM Conference on Integrative Physiology of Exercise (poster). September 2014.
- 2) Baseline characteristics of collegiate female swimmers with and without symptomatic exertional rhabdomyolysis after a post-season upper body workout: a search for internal and external risk factors (co-authors: Cooper A, Bhullar N, Dean C, Kaufmann K, Markho S, Landis-Piowar K, Banner-Aprik C). International Sports Science Symposium: Performance Enhancement and Technology, Eugene, OR (oral). July 2014.
- 3) Bone: an acute buffer of plasma sodium concentration during exhaustive exercise? (*co-authors: Stuempfle KJ and Hoffman MD*) Midwest American College of Sports Medicine Meeting, Oregon, OH (poster) November 2012
- 4) Exercise-associated changes in vasopressin and oxytocin in humans: physiology or pathophysiology? (*co-author Verbalis JG*) World Congress of Neurohypophysial Hormones, Boston, MA (poster) July 2011
- 5) Sodium balance in runners participating in a mountain footrace (*co-authors: Rogers IR, Stuempfle KJ, Weschler LW, Verbalis JG and Hoffman MD*) American College of Sports Medicine's Annual Meeting, Baltimore, MD (poster) June 2010
- 6) Hypogonadal male runners do not display endocrine or performance decrements during prolonged endurance running (*co-authors: Jordaan E, Noakes TD, Soldin SJ and Verbalis JG*) Experimental Biology Meeting, New Orleans, LA (poster) April 2009

STUDENT PRESENTATIONS AT CONFERENCES (faculty advisor initiated and supported)

- 1) ACSM Annual Meeting, Indianapolis, IN June 2013:
 - a. Implications of gastrocnemius strength and gastrocnemius flexibility as risk factors for post-marathon patellofemoral pain in recreational runners. *Anna Szymanski, Marie-Eve Pepin, Charles Marks, Tamara Hew-Butler FACSM, Oakland University, MI*
 - b. Effect of yoga on mile time performance in male high school runners, *Brigid Nash, Tamara Hew-Butler FACSM, Oakland University, Rochester, MI*
- 2) American Medical Athletic Association's 41st Annual Sports Medicine Symposium at the Boston Marathon, Boston, April 2012: Thirst and Sodium Palatability During Running: Can We Trust Our Bodies to Guide Individual Fluid Needs? Speaker: *Jed Hummel, MS candidate, Oakland University*

- 3) Michigan ACSM Meeting (MIACSM) Gaylord, MI Feb 2012: Symposium: The effect of the Vasopressin 2 receptor on fluid balance and performance in distance runners
 - a. Effect of the V2 receptor on plasma and urine variables, *Jeff Cross, Michigan State University*
 - b. Effect of the V2 receptor on sweat, saliva thirst and sodium ratings, *Jed Hummel BS ACSM-CES, OU*
 - c. Effect of the V2 receptor on core temperature, fluid balance and performance, *Brian Rider, University of Tennessee*
- 4) ACSM Annual Meeting, Indianapolis, In June 2013:
 - a. Effects of Acute Caffeine Intake on Wingate Test Performance in a Creatine Supplemented State. *Seaton AM, Marks RC, Engels HJ, Hew-Butler T, Seaton MJ.*
 - b. Does pre-cooling enhance maximal aerobic capacity in individuals with multiple sclerosis? *Palazzolo J, Marks RC, Saliga S, Hew-Butler T.*
- 5) Midwest ACSM Meeting 2012: The effect of active and passive recovery on blood lactate and performance in elite male hockey players. *Siekirk NJ, Goslin BR, Hew-Butler T, Marks RC.*

GRANTS, CONTRACTS

- 1) The Effects of Acute Cumulative Training in Muscle Damage, Fatigue Ratings, Renal Function and Sodium Balance in Collegiate Swimmers. \$3000 PRC Seed Grant 2015
- 2) The Student Athlete Performance Fueling Program: an Observational Study (*PI, on award*) \$3000 PRC Seed Grant 2013
- 3) Proof of Concept: Exercise, Irisin and metabolic fat activation in humans (*PI, on award*) \$15,000 OU URC, PRC Matching grant 2012-2013
- 4) Revisiting the Human Sweat Gland: Simple Garden Hose or Complex Effector Organ (*co-PI to Verbalis JG on award*) \$46,000 Otsuka America Pharmaceutical, Inc. 2012 (match grant)
- 5) Revisiting the Human Sweat Gland: Simple Garden Hose or Complex Effector Organ (*PI, on award*) \$9,000 OU University Research Committee 2011
- 6) The Efficacy of Oral versus Intravenous Hypertonic Saline in the Treatment of Exercise-Associated Hyponatremia without Altered Mental Status (*PI, with Hoffman MD, Rogers IR and Stuempfle KJ as co-PI's*) \$7,000 Western States Endurance Run Foundation 2010
- 7) Sodium Balance in Male Runners Participating in a 160km Footrace (*PI, with Hoffman MD and Stuempfle KJ, Weschler L, and Rogers IR as co-PI's*) \$10,500 Western States Endurance Run Foundation 2009