

# RESEARCH NEWSLETTER

Northwestern University Feinberg School of Medicine, Department of  
Emergency Medicine

Spring 2020

## A Warm Welcome to Garth Walker



Garth Walker, MD MPH, joins us for the next year as a T37 trainee in the Northwestern University Minority Health and Health Disparities Research Training Program. He recently completed his emergency medicine residency at the University of Chicago. During his fellowship year he will be mentored by faculty in the Buehler Center as he studies health disparities in gun violence and opioid overdose. Dr. Walker was recently named one of the National Minority Quality Forum's 2020 40 under 40 Leaders in Health Award. Among the achievements that earned him that accolade are being a cofounder of Clinify Inc (a tech platform that uses social determinants of health indicators to improve patient engagement and outcomes) and serving as a board member for American Foundation for Firearm Injury Reduction in Medicine (AFFIRM).

## COVID-19 Research Updates

The coronavirus pandemic has ignited research on many fronts. The global effort to understand and curb the virus has in turn increased collaboration and this is true in EM as in other specialties. Northwestern Medicine is already enrolling patients in multiple clinical trials for COVID-19 treatment, including Remdesivir and Sarilumab, with other trials, such as convalescent serum treatment, on the horizon. Closer to home, our Emergency Medicine faculty and residents have been contributing scholarly work on a variety of topics including: the development of an incident command structure, the personal protective equipment "burn" rate in the hospital, and the rapid construction of open-air and neutral airflow rooms in the ED. Many other studies are in early stages, including evaluations of how COVID-19 has changed patterns of overdose and violence, the mental health of frontline workers, and changes in ED use patterns related to COVID.

I look forward to seeing the outcomes of these studies and more in the coming months as we all learn together in this unprecedented time.

– Dr. Danielle McCarthy

## Alumni in Research

Dr. Brian Patterson, NUEM 2013



Dr. Brian Patterson received his master's in public health and medical degree from Northwestern University Feinberg School of Medicine; he then joined the NUEM residency training program, eventually being named chief resident of the NUEM class of 2013. Dr. Patterson is now the Physician Informatics Director for Predictive Analytics for UW Health, and an Assistant Professor in the BerbeeWalsh Department of Emergency Medicine at the University of Wisconsin. His research program is focused on using routinely collected clinical data to generate actionable insights to improve the quality and safety of emergency care for older adults. His current work focuses on using techniques including natural language processing and machine learning to analyze electronic health record data and designing decision support tools to bring this data back to clinicians.

**You had an early interest in research and pursued an MPH while in medical school with Dr. Kyriacou serving as your thesis mentor. How did you first become interested in emergency medicine research?**

I knew by my third year of med school that I was going to go into emergency medicine. Since I needed to complete an MPH thesis, I got hooked up with Dr. Kyriacou as a thesis advisor. I really enjoyed working with him and the other researchers in EM, so it seemed natural to continue projects going into residency. It was great to have positive role models who encouraged me to do public health research focused within EM.

**How did your residency experience contribute to your decision to pursue a research career after residency?**

My feelings in residency regarding research swung pretty wildly. When I started intern year, I was fresh out of my MPH and thought it would be important to continue to do at least some research throughout my career. By my second year in residency, I was really focused on clinical medicine and research seemed like it would be more of a distraction; for a while I thought I'd probably be focused more on a purely clinical career. As I continued through residency my interest in research gradually increased again and I became involved in a couple of data analysis projects that really got me interested in the promise of using EHR generated data to improve patient care.

**As faculty at University of Wisconsin, you have been very successful, with more than 18 publications since joining the faculty in 2013 (and six first or senior author pubs in 2019 alone!). Tell us about one of your favorite recent publications.**

My favorite recent publication is “Training and Interpreting Machine Learning Algorithms to Evaluate Fall Risk After Emergency Department Visits.” The emphasis in this paper is on interpreting the results of our predictive model for falls risk. There is a lot of literature right now focused on theoretically demonstrating that machine learning models can predict patients’ risk for a lot of health outcomes. This data is not particularly useful without some concrete way of intervening to prevent these outcomes. In this study we tried to go a bit further and generate some projections for the real-world impact of pairing a known intervention (referral to a falls risk clinic) with our model output. We projected performance in terms of Number Needed to Treat (NNT) so we could easily communicate our results with both clinicians and policymakers. We’re currently piloting the model now at UWH, so stay tuned to see if our predictions were close.

**You have also been successful in obtaining grant funding and are currently in the middle of a 5-year K-award (career development award) from the Agency for Healthcare Research and Quality. What research question(s) are you seeking to answer with your K-award and what have you found so far?**

The K award supports the falls risk project in the above paper. It has three aims: using natural language processing to identify fall risk factors in clinical notes, using machine learning to automatically stratify older adults for fall risk, and piloting a program where we use a decision support tool to facilitate referral for high risk patients. One of the major goals of a K grant is to get training in techniques as you complete a project, and I feel like I’ve learned a lot from mentors in computer science and engineering. My naïve assumption had been that all of my work would be on the computer science side developing the risk stratification tool, but it turned out that predicting outcomes is often the easy part. So far for us the more challenging task has been to get our results back into workflows in the emergency department in a way clinicians find helpful.

**You have recently taken on the inaugural role as the Physician Informatics Director of Predictive Analytics, what made you connect informatics with your health services research?**

Initially I was interested in more traditional health services research and became involved in EHR data extraction mostly to try to get granular data on utilization patterns in the ED. As I started that work, I had the opportunity to meet and collaborate with mentors who have a more informatics-based approach. Gradually I’ve become more and more interested not just in extracting data from the EHR but in using it to move towards a learning health system: one that can take insights from the data we generate through our clinical practice to improve patient care. I’ve found that having an operational role in the health system complements my research work by giving me an outlet to try to affect the type of change I’m preaching on the research side.

**What are your future research and career plans?**

I am interested in continuing to take on projects which demonstrate and build on our capabilities to use existing data to improve patient care both during and after emergency department visits. I’m hopeful that individual projects like our falls risk model will lead to more broadly applicable procedures for deriving predictive models, and more importantly translating these models into clinical practice in a way that helps improve both patient outcomes and improve provider burden.

# Media Watch



Lori Post, PhD, discusses the increase in domestic violence following the shelter-in-place order, with WGN Radio and Health Day.

## CHICAGO SUN-TIMES

Garth Walker, PhD, wrote an opinion piece for the Sun-Times about the health risks that African-Americans face and the roots of those problems.

## HEALTHCARE FINANCE

James Adams', MD and CMO, recently published paper on physicians great risk of contracting and spreading COVID-19 due to stress and exposure, was featured in an article about healthcare worker's mental health during these times.

## JAMA Network Open

Howard Kim, MD, wrote "Overcoming Barriers to Prescribing Buprenorphine in the Emergency Department" for JAMA Network Open.

## NORTHWESTERN NOW

For more news on research throughout Northwestern check out Northwestern Now, and the "Take this seriously video" featuring George Chiampas, DO.

# Faculty and Fellow Focus



Dr. Danielle McCarthy was recently named an Outstanding Peer Reviewer for AEM 2019. This annual designation was given to just 8 people for their excellent reviews and their exceptional guidance to academic contributions in research.



*The below were all accepted but unable to present at this year's conference:*

**Lo AX**, Archual G, Hemmert KC, Kenny JF, Schmitz TW, **Desden SM**, Southerland LT. "Grandma's 2-Day ED Stay: Adapting ED Operations and Bench-marking Metrics for Older Adults"

**Lo AX**, **Courtney DM**. "Pursuing a Research Career in EM: Preparation, Employment Options, Marketability, Career Trajectories and Myths."

Carpenter C, Hammouda N, Linton E, Doerring M, Ohuabunwa U, Kelly K, Hung W, Shah M, Lindquist L, Biese K, Hoy L, Nerbonne L, Hwang U, **Dresden S**. "Geriatric Emergency Care Applied Research Network (GEAR) Delirium Research Prioritization"

**Conrardy M**, **Fant A**, **Malik S**, Tyler D, **Cruz D**, **Lank P**, **Howard KS**. "Midazolam vs Lorazepam for Agitation: Effect on Emergency Department Length of Stay"

Hwang MI, **Powell EP**, Bond WF. "Automated alerts for septic patients in the Emergency Department: A systematic review of screening test accuracy and quality measure studies."

**Howard KS**. Additional presenters; **McCarthy DM**, Lin M, Rising K, **Courtney DM**. "Demystifying Patient-Centered Research and Incorporating Patient-Reported Outcomes Into Your Research Approach"

**Akhetuamhen A**, **Ibiebele A**, **Bailitz J**. "Creating an Emergency Medicine<sup>4</sup> Resident Cultural Competency Curriculum: Results of a Validated Needs Assessment"

## Publications Update

Published since November 2019

**Kim HS**, Samuels EA. Overcoming barriers to prescribing buprenorphine in the emergency department. *JAMA Netw Open*. 2020 May 11;3(5). PMID: 32391889

**Lo AX**, Carpenter CR. Balancing Evidence and Economics While Adapting Emergency Medicine to the 21st Century's Geriatric Demographic Imperative. *Acad Emerg Med*. 2020 Apr 26. PMID: 32335974

Chadha S, McLone S, **Mason M**, Sheehan K. Adolescent Firearm Homicides in Chicago, 2013-2017. *J Adolesc Health*. 2020 Apr 12. PMID: 32295721

Rivera AS, Akanbi M, O'Dwyer LC, **McHugh M**. Shift work and long work hours and their association with chronic health conditions: A systematic review of systematic reviews with meta-analyses. *PLoS One*. 2020 Apr 2;15(4):e0231037. PMID: 32240254

**McHugh M**, Farley D, Rivera AS. A Qualitative Exploration of Shift Work and Employee Well-Being in the US Manufacturing Environment. *J Occup Environ Med*. 2020 Apr;62(4):303-306. PMID: 32032186

**Eswaran V**, Allen KC, Bottari DC, Splawski JA, Bains S, Aks SE, Swoboda HD, Moore PQ, Tran TH, Salisbury-Afshar E, **Lank PM**, **McCarthy DM**, **Kim HS**. Take-Home Naloxone Program Implementation: Lessons Learned From Seven Chicago-Area Hospitals. *Ann Emerg Med*. 2020 March 30. PMID:32241746

**McCarthy DM**, **Kim HS**, Hur SI, **Lank PM**, **Arroyo C**, Opsasnick LA, **Piserchia K**, Curtis LM, Wolf MS, **Courtney DM**. Patient-Reported Opioid Pill Consumption After an ED Visit: How Many Pills Are People Using? *Pain Med*. Published 2020 March 27. PMID:32219431

Fishbein A, Noor H, Zhao SH, Kruse L, **Mason M**, Ariza A, Bolanos L, Necheles J, Kaye Bennett. Management of Atopic Dermatitis in Children <2 years old by Community Pediatricians: A Survey and Retrospective Chart Review. *J Pediatr*. 2020 Mar 11. PMID: 32171558

**Lo AX**, Heinemann AW, Gray E, Lindquist LA, Kocherginsky M, **Post LA**, **Dresden SM**. Inter-rater Reliability of Clinical Frailty Scores for Older Patients in the Emergency Department. *Acad Emerg Med*. 2020 Mar 6. PMID: 32141671

**Colton K**, **Richards CT**, **Pruitt PB**, Mendelson SJ, Holl JL, Naidech AM, Prabhakaran S, Maas MB. Early Stroke Recognition and Time-based Emergency Care Performance Metrics for Intracerebral Hemorrhage. *J Stroke Cerebrovasc Dis*. 2020 Feb;29(2):104552. PMID: 31839545

Rising KL, **Powell RE**, Cameron KA, **Salzman DH**, Papanagnou D, Doty AMB, Latimer L, **Piserchia K**, McGaghie WC, **McCarthy DM**. Development of the Uncertainty Communication Checklist: A Patient-Centered Approach to Patient Discharge From the Emergency Department. *Acad Med*. 2020 Feb 25. PMID:32101919

Calvocoressi L, Reynolds J, Johnson B, Warzoha MM, Carroll M, Vaca FE, **Post L**, Dziura J. Quality and Publication of Emergency Medicine Trials Registered in. *West J Emerg Med*. 2020 Feb 24;21(2):295-303. PMID: 32191186

Lu DW, Lall MD, Mitzman J, Heron S, Pierce A, Hartman ND, **McCarthy DM**, Jauregui J, Strout TD. #MeToo in EM: A Multicenter Survey of Academic Emergency Medicine Faculty on Their Experiences with Gender Discrimination and

Sexual Harassment. *West J Emerg Med*. 2020 Feb 21;21(2):252-260. PMID: 32191183

**McCarthy DM**, Powell RE, Cameron KA, **Salzman DH**, Papanagnou D, Doty AM, Leiby BE, **Piserchia K**, **Klein MR**, Zhang XC, McGaghie WC, Rising KL. Simulation-based mastery learning compared to standard education for discussing diagnostic uncertainty with patients in the emergency department: a randomized controlled trial. *BMC Med Educ*. 2020;20(1):49. 2020 Feb 19. PMID:32070353

**Salzman DH**, Rising KL, Cameron KA, Powell RE, Papanagnou D, Doty A, **Piserchia K**, Latimer L, McGaghie WC, **McCarthy DM**. Setting a Minimum Passing Standard for the Uncertainty Communication Checklist Through Patient and Physician Engagement. *J Grad Med Educ*. 2020 Feb;12(1):58-65. PMID:32089795

Southerland LT, **Lo AX**, Biese K, Arendts G, Banerjee J, Hwang U, **Dresden S**, Argento V, Kennedy M, Shenvi CL, Carpenter CR. Concepts in Practice: Geriatric Emergency Departments. *Ann Emerg Med*. 2020 Feb;75(2):162-170. PMID: 31732374

Kwon S, **Welch S**, **Mason M**. Physical education environment and student physical activity levels in low-income communities. *BMC Public Health*. 2020 Jan 31;20(1):147. PMID: 32005209

**Kim HS**, **Courtney DM**, **McCarthy DM**, Cella D. Patient-reported Outcome Measures in Emergency Care Research: A Primer for Researchers, Peer Reviewers, and Readers. *Acad Emerg Med*. 2020 Jan 16. PMID: 31945245

**Dresden SM**, Hwang U, Garrido MM, Sze J, Kang R, Vargas-Torres C, **Courtney DM**, Loo G, Rosenberg M, Richardson L. Geriatric Emergency Department Innovations: The Impact of Transitional Care Nurses on 30-day Readmissions for Older Adults. *Acad Emerg Med*. 2020 Jan;27(1):43-53. PMID: 31663245

Adeola J, Badejo OA, Ahonkhai A, Okonkwo P, Aboh Akande P, Evans CT, **McHugh M**, Pierce L, Ahmed I, Jolayemi T, Ladi Akinyemi B, Onwuatuolu I, Murphy R, **Kyriacou D**, Musa J5, Agaba P. Effect of Baseline Symptom Manifestations on Retention in Care and Treatment among HIV-Infected Patients in Nigeria. *J Int Assoc Provid AIDS Care*. 2020 Jan-Dec;19. PMID: 32027211

**Marshall AG**, **Sista P**, **Colton KR**, **Fant A**, **Kim HS**, **Lank PM**, **McCarthy DM**. Women's Night in Emergency Medicine Mentorship Program: A SWOT Analysis. *West J Emerg Med*. 2019 Dec 18;21(1):37-41. PMID: 31913816

**McHugh M**, Brown T, Liss DT, Persell SD, Garrett M, Walunas TL. Qualitative evaluation of a cardiovascular quality improvement program reveals sizable data inaccuracies in small primary care practices. *BMJ Open Qual*. 2019 Nov 27;8(4):e000702. PMID: 31803852