We interviewed Lauren Westafer, DO, MPH, Fellow of the Institute for Healthcare Delivery and Population Science (IHDPS) and Assistant Professor in the Department of Emergency Medicine at UMMS-Baystate, about her recent article, which appeared in Academic Emergency Medicine and was selected as the June ‘Editor-in-Chief Pick of the Month.’

**What was the motivation for this study?**

Evaluation for suspected pulmonary embolism (PE) in the emergency department (ED) is quite common. In fact, in the United States an estimated 1 - 2% of all 120 million ED patients undergo the gold standard test, computed tomographic pulmonary angiography (CTPA). Yet only 3-10% of these scans show PE, subjecting many patients to unnecessary radiation and cost. Additionally, one little revealed fact about CTPAs is that 5-25% of studies that report a PE, when reviewed by another radiologist are deemed to be false positive PEs. Multiple risk stratification tools exist and have been validated for more than a decade yet overtesting persists. We used implementation science theory and frameworks to understand why clinicians evaluate for PE the way they do and how we might improve evidence-based testing in PE.

**What were the main findings?**

We found several common barriers and facilitators to the evidence-based evaluation of suspected PE (see figure). Individual barriers were very common. Despite clinicians reporting familiarity and use of the risk stratification tools, misunderstanding and lack of knowledge of the scoring systems were common. Additionally, clinicians grappled with belief about consequences - fear and anxiety about potential missed cases. Surprisingly, malpractice and litigation were minimally contributory. We found that some implementation strategies, such as pop-up notifications in the electronic health record were perceived as cumbersome and too late in the workflow for emergency department clinicians. We found that the institutional culture and peer pressure, established through algorithms endorsed by the institution and audit-feedback with peer comparison, were perceived as valuable motivators for change.
What are the implications of these findings?
Tackling the barriers and facilitators we discovered in this study is an ideal starting place to promote rational testing for PE.

How do these results apply to Baystate?
At Baystate, like the rest of the nation, our CTPA yield is consistently <8%, demonstrating we have significant work to do. I have submitted a K23 proposal to NHLBI proposing further developing and evaluating strategies for de-implementing low value imaging in PE using a simple diagnostic algorithm, novel educational techniques to address misunderstandings of the commonly use risk stratification tools, and audit-feedback.

Engagement of Mothers in Recovery from OUD enrolled in Early Intervention


We interviewed Elizabeth Peacock-Chambers MD MSc, Assistant Professor of Pediatrics at UMMS-B and a fellow of the IHDPS about her recent paper, which appeared in *Pediatrics*.

What was the motivation behind this study?
Early Intervention (EI) is an evidence-based system of services shown to improve the developmental outcomes of young children with developmental delay or risk for delay by providing comprehensive home-based services. Infants of parents with substance use disorders frequently qualify due to their potential risk for delay. The motivation behind this study was to explore maternal perceptions and experiences that impact enrollment and engagement in EI services among mothers in recovery from opioid use disorders (OUDs). We were also interested in understanding their perceptions of the potential benefits of EI. We did this by conducting interviews and focus groups with 28 participants, all mothers at different stages of recovery from OUDs.

What were the main findings?
Five major themes and 11 subthemes emerged describing a range of maternal perceptions and experiences related to EI (see figure above). We mapped these themes onto an EI engagement framework that demonstrates the stages of engagement that parents undergo when moving through the EI enrollment process. We identified the fears, ambivalence, and stigma they encounter, as well as their growth.
Learning Health System: How We Built a Baystate COVID-19 Registry in Record Time

Pandemic as a catalyst for rapid improvement

As the novel COVID-19 pandemic placed a tremendous stress on our healthcare system, we recognized that we were in a crisis situation where the need for technology, data, and research was evident. The pandemic crisis has revealed not just vulnerabilities in our system but also transformative opportunities. Our institution acted rapidly to establish a new governance system to ensure appropriate and rapid response to COVID-19 issues. At the heart of the system was the information technology (IT) integration with focus on the ways that IT could support the ongoing needs of the organization. To do so, IT had to work in much closer collaboration than ever before with clinicians, epidemiologists, and researchers to determine appropriate definitions, display of data, and evaluation of the initiatives implemented.

One of the success stories resulting from this close collaboration was the creation of the Baystate COVID-19 database. Responding to the needs of BH senior management, clinical trial sponsors, and local investigators, individuals from across the enterprise are working together to develop and maintain a COVID-19 database. The Data Analytics group is responsible for compiling data from disparate sources into a single database (currently 244 tables), performing initial data cleaning and validation, and ensuring there is a reliable way to link data points by person and encounter. Having a single database for COVID-related information ensures that the answers to operations requests and research project questions will have compatible answers. The Epidemiology and Biostatistics Research Core (EBRC) extracts, links, cleans, and analyzes data from the database to meet the specific needs of each research project. Clinicians validate the accuracy of the information. Medical students extract data from the EHR to supplement the registry with non-structured data such as symptoms, risk factors, social determinants of health, etc. The final set of variables collected is based on the expected availability of relevant information and ease of data collection. Included data variables cover: demographics, severity predictors, admission information, hospitalization information, therapies used, and discharge information. As July 10th, 2020, there were 1,214 encounters of patients with COVID-19 infection in our healthcare system.

For clinical trials, we use the COVID database to support cohort discovery, informing sponsors about our population, and helping us assess our ability to meet sponsors’ enrollment goals. For observational studies and local research, the database helps us define the cohort and is the source of clinical and demographic information. The registry supports quality improvement and clinical care projects to better understand the characteristics and outcomes of the patients hospitalized in our health care system; validate performance of prediction models developed outside BHS; and perform rapid evaluation of the innovations implemented to decide if they should be continued or discarded. Having sufficient data is the critical first step to understanding the impact of COVID-19 on our patients. There is still more work to be done, such as additional data cleaning and collection of specific maternal and neonatal information into tables.
COVID-19 has shown the importance of rapidly bridging the gap between research and operations as clinical leaders needed to know which interventions were working and for which patients. Refining the learning from the crisis to permanently adopt new ways of working together to support the learning health system will be key to future success. The scale of change unleashed by the crisis will restructure healthcare over many months and years; and reinforce the need to permanently embed cross-collaboration, speed of decision-making, execution, and evaluation into our daily work.

BLACK LIVES MATTER SERIES

Words Matter: How do you operationalize race in healthcare research and practice?

Frank Robinson, PhD, Cristina Huebner Torres, PhD, Yemisi Oloruntola-Coates, MA, MAMC

The meaning of race is rarely specific or precise with respect to its social and cultural origins, its use within the social and behavioral sciences, and in epidemiologic and medical research. Race is frequently used as a marker of social, economic, and environmental disparities between groups. Historically, race was used erroneously as a biological variate for distinguishing differences between populations. We know there is no biological basis for racial distinction. Yet, still today there is ample evidence of racial bias in medicine rooted in beliefs of biological difference between racial groups. Ask yourself: How are you operationalizing “race” as a variable in your research, public health practice, clinical service, population health or educational/training programs?

To do so, one must first understand the artificial origins of race as a social construct used to categorize based on oppression, historical group dominance, and arbitrary though intentional distinction by phenotypic expression (skin color). Race [and ethnicity], inextricably linked to its bookend derivative “racism”, categorizes human populations into groups commonly labeled White, Black/African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander as defined by the U.S. Census for the seemingly benign purposes of counting groups and identifying differences or gaps between them (e.g. health disparities). The term people of color (POC) has been used for centuries. More recently, the term BIPOC (Black, Indigenous, and people of color) has come into use to ensure adequate representation of darker hue and indigenous peoples, groups frequently overlooked when broadly considering POC. A range of theoretical frameworks situate race and racism within an historical and/or political ecologic lens to include critical race theory, Latino Critical Race Theory (LatCrit), and ecosocial theory (Krieger, 2012). However, racism is not theoretical. It is the malignant expression of power by Whites over BIPOC based on systemic and structural oppression and other forms of racism.

Racism Spectrum: Terms and Definitions

The individual forms of racism expressed in the spectrum have true meaning when they are framed in the larger context of racial oppression. Oppression is the state of unequal group access to power and privilege. The more dominant group (White) use their power to exert violence on, exploit, marginalize, deny equal rights, and inferiorize the “other” (BIPOC). Privilege is enjoyed by the dominant group and may be defined as unearned power that is easily or readily available as a result of their social group membership.

1.) Systemic or institutional racism is official and/or state sanctioned racism (apartheid), it is evident as both de jure of legal racism (e.g., 3/5 human in the constitution, racial apartheid in the form of black codes and Jim Crow laws, and Redlining) and de facto racist practices, the outcome of private activity, not law or explicit public policy.

2.) Structural racism – The process of racialization, “racism-as-practice”, is organized, deliberate, and essential actions for attributing racial meaning to people’s identity and,
in particular, as they relate to social structures and institutional systems (housing, employment, and education). This process is designed to maintain the structures of power and privilege over BIPOC communities, beginning in 1619 and acknowledged by historic and contemporary policies, practices, and norms long after the formal abolition of American apartheid (Jim Crow).

3.) **Cultural racism** – A system of cultural norms and standards that support and protect an Eurocentric worldview by minimizing the culture and contributions of “others”. The material and symbolic racism in television tropes accomplished everything that biological racism declaring inherent inferiority of nonwhites accomplished. In “Bonanza”, “Gunsmoke”, and “The Andy Griffin Show”, Black people simply did not exist. However, in “Amos and Andy”, Black actors were larger than life racist profiles and exaggerated stereotypes of Black life.

4.) **Interpersonal racism** (personally mediated) occurs between individuals which ranges from covert micro-aggressions (e.g., Whites ask the sister in a natural hair style, such as cornrows, “Can I touch your hair?”) to extreme overt actions (white supremacist murdered nine worshippers at the historic Emanuel African Methodist Episcopal Church in Charleston, S.C.)

5.) **Internalized racism** lies within individuals as a system of empirical beliefs, conscious or unconscious bias about race and racism that is influenced by our culture. Sustained denigration and injustice that the oppressed are subjected to often lead to a state of learned self-doubt, identity confusion, and feelings of inferiority.

Understand the history and implications of the words frequently used in healthcare, research, education and society to categorize groups by race/ethnicity. Understand that the social construction of difference, though artificial, are embedded into the body politic, into all institutions, into policies, systems and into our embodied experiences. Words matter—know their names.

In our next segment, we will explore the implications of racism in healthcare and offer resources and tools to address antiracism.

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5. Race Forward - Founded in 1981, Race Forward brings systemic analysis and an innovative approach to complex race issues to help people take effective action toward racial equity. [https://www.raceforward.org](https://www.raceforward.org)
Apply for an IHDPS Appointment

If you have an interest in pursuing research focused on healthcare delivery or population health, we want you to join us. We welcome applications for faculty appointments in the Institute for Healthcare Delivery and Population Science.

For more details, see here.

Summer Student Profiles

♦ Anna Tidswell: I am a rising junior at Vassar College where I study neuroscience and economics. This summer I am working with Dr. Mihaela Stefan to help create a database, through chart abstraction, of information on patients who have tested positive for COVID-19 at Baystate Medical Center. I am excited to have the opportunity to be part of this team working to generate new knowledge about COVID-19.

♦ Caroline Norton: I just completed my first year at the University of Massachusetts Medical School. I have a longstanding interest in disability advocacy and research and am working to improve care for patients with disabilities over the course of my medical career. Four years after completing the Baystate Summer Scholars Program for undergraduate students, I am excited to return to Baystate and work with Dr. Lagu again.

♦ Elaine Flynn: I am a rising second year medical student at the University of Massachusetts Medical School working with Drs. Lindenauer and Spitzer to design a survey to assess the impact of the COVID-19 pandemic on young Instagram users with asthma. Working on this project has been an invaluable opportunity to sharpen my skills of scientific inquiry and to gain an appreciation for the process of designing a research question. I have enjoyed working as part of a team and I know I will be able to apply the knowledge I have gained this summer throughout my medical education and beyond!

♦ Emily Vicks: I am a rising second year medical student at University of Massachusetts Medical School in the PURCH program. I am from the small town of Clinton, NY, and majored in neuroscience at Middlebury College. Before medical school I pursued several experiences: I volunteered as a ski patroller, worked medical assistant for maternal fetal medicine at the University of Vermont Medical Center, taught spin classes, and backpacked through New Zealand and Australia. I am inspired by the medical community and their efforts to care for patients with COVID-19 and I feel honored to help in any way I can on this research project in the search to understand COVID 19.

♦ Eve Manghis: I am a rising second year medical student in the PURCH track at University of Massachusetts Medical School, working with Dr. Mihaela Stefan on the development of a COVID-19 registry. My academic background is in anthropology and community-based research, which I hope to incorporate into my career as a physician. Through working on this project, I have developed a strong appreciation for the care that has been delivered to COVID-19 patients at Baystate.

♦ Jessica Cox: I am currently going into my second year at Bard micro college in Holyoke where I will be graduating in May 2021 with an associate’s degree in liberal arts. I’m a single mother of two incredible boys ages 2-1/2 and 16. I am a Vermont native and moved to Massachusetts two years ago, to be closer to my mom and the boys’ grandmother. My goal is to gain my bachelors and then complete a master’s degree in public health. I want to pursue a career in Addiction Treatment and Recovery.

♦ Kim Burke: I am a rising second year in the PURCH-Baystate track at UMass Medical School. I am working with Dr. Schoenfeld on the development of a shared decision-making aid to facilitate initiation of buprenorphine in the emergency department. My particular interests include health systems building, refugee health, and cultural disparities in healthcare. I hope to leverage these interests for an exciting career in emergency medicine, internal medicine, or infectious disease. This summer, I look forward to adding research methodologies to my skill set and being surrounded by the amazing mentorship at Baystate!

♦ Lulu Xu: I am currently getting my Masters in Clinical Investigation in between my 3rd and 4th years of medical school at UMass. I hope to one day use implementation research to reduce healthcare disparities and affect policy. I am planning on applying to Pediatrics and I am particularly interested in learning how to mitigate the effects of trauma in children.

♦ Michael Dean: I am a rising junior at Bowdoin College. This summer, I’m working with Dr. Soares on a series of interviews with hospitals in Massachusetts. In the interviews, we are assessing the impact of opioid laws in Massachusetts on Emergency Department practice, specifically evaluating the prescribing of opioids and the treatment of patients with opioid use disorder. I hope to go to med school...
in the future, and so far I’ve enjoyed helping select which hospitals we plan to inter-
view and shadowing Dr. Soares in the emergency department.

♦ Paula Whitmore: I am a rising second year medical student at UMass Med-
cial School. I am interested in practicing family medicine and working on com-
munity health issues in rural underserved areas. This summer I have been
working on chart abstraction for Dr. Stefan and the COVID-19 registry team. I
have enjoyed the opportunity to contribute to COVID-19 research efforts and
become more familiar with the EHR system.

♦ Poornima Manikantan: I am a fourth-year medical student in the PURCH
track at the University of Massachusetts Medical School, working with Dr.
Mihaela Stefan on the COVID-19 registry project. I am excited to learn more
about the COVID-19 predictive model. I hope to pursue internal medicine and
continue qualitative research as a resident.

♦ Tori Powell: I am a rising second year medical student in the PURCH track
at University of Massachusetts Medical School and am working with Dr. Stefan
on the COVID registry. Before medical school, I completed my MPH in Epidemi-
ology and Biostatistics and worked in Infectious Disease research for three
years. This summer I’ve enjoyed working with other students and researchers
and learning about how to build a patient registry.

♦ Sabahat Rahman: I am a rising second year medical student in the PURCH
track at the University of Massachusetts Medical School. I completed my bache-
lor’s degree in Public Health and Molecular & Cell Biology at UCB and a master’s
degree in Global Health Sciences at UCSF. This summer, I’m working with Dr.
Stefan on the COVID-19 registry to gain a better understanding of the burden
of this disease in the greater Springfield area, specifically across various demo-
graphic subgroups.

Farewell to Brent

While we are sad to say goodbye to Research Assistant Brent Heineman, we’re thrilled
that he will be embarking on the next phase of his career! In August, after 2 years with
Baystate, Brent will be starting med school at the University of Connecticut Medical
School. Thank you for your contributions to the IHDPS and Baystate these last few years! You
will be missed.

Recent IHDPS Publications: June-July

1. Tenforde MW, Kim SS, Lindsell CJ, Billig Rose E, Shapiro NI, Files DC, Gibbs KW, Erickson
   HL, Steingrub JS, Smithline HA, Gong MN, Aboodi MS, Exline MC, Henning DJ, Wilson JG,
   Khan A, Qadir N, Brown SM, Peltan ID, Rice TW, Hager DN, Ginde AA, Stubblefield WB, Pa-
   tel MM, Self WH, Feldstein LR. Symptom Duration and Risk Factors for Delayed Return to
   Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Net-
   (30):993-998. PMID: 32730238. PubMed

   of Hydrocortisone, Ascorbic Acid, and Thiamine in Adults with Septic Shock. Am J Respir

3. Burkart S, Marcus BH, Pekow P, Rosal MC, Manson JE, Braun B, Chasan-Taber L. The im-
   pact of a randomized controlled trial of a lifestyle intervention on postpartum physical ac-
   PMCID: PMC7380594. PubMed


