Identifying barriers and facilitators to an evidence-based approach to diagnosing pulmonary embolism in the emergency department

We interviewed Lauren Westafer, DO, MPH, Emergency Medicine Physician at Baystate Medical Center and Fellow in the Institute for Healthcare Delivery and Population Science (IHDPS), about her newly awarded K12 grant from the Massachusetts Consortium for Cardiopulmonary Implementation Science Scholars (MCCISS). The MCCISS program is a collaboration between UMMS, UMMS-Baystate, and the Veteran Affairs health system in Boston. Dr. Westafer’s two-year mentored career development award provides advanced training in Implementation Science and enables early stage investigators to gain research experience and develop preliminary data to support future proposals. Implementation science is defined as the study of methods and strategies to promote the uptake of interventions that have proven effective into routine practice, with the aim of improving population health.

What are the objectives of your research project?
The main goal of this research is to understand how providers approach testing for pulmonary embolism (PE) and to develop strategies to increase the use of evidence-based risk stratification tools aimed at reducing unnecessary imaging. Testing for PE is common, with computed tomographic pulmonary angiography (CTPA) ordered in 1-2% of all visits to the emergency department (ED). The number of CT-PA ordered has risen dramatically over the past two decades and a decreasing percentage (2-10%) is positive for PE. Risk stratification tools such as the PE Rule Out Criteria (PERC), the Wells Score, and the age-adjusted d-dimer have been around for over a decade and endorsed by major guidelines, yet providers often fail to use these tools and image low-risk patients for PE. Using qualitative interviews at multiple sites, we aim to identify the barriers and facilitators to providers using these tools and design targeted strategies to increase their use. I am fortunate to be supported by a superb team of mentors, including Peter Lindenauer, Mihaela Stefan, Kathy Mazor, and Tim Mader to train towards becoming an independent clinician investigator.

What does this research mean for patients cared for at Baystate?
Strategies to help providers use risk stratification tools will ultimately reduce unnecessary imaging for PE, benefiting patients and the health system more generally. Low-value CTPAs result in excess radiation and cost, and clog the queues for imaging. Additionally, new generation CT scanners are too sensitive, with 10-25% of positive CTPAs read as negative or equivocal. Increasing evidence-based testing would reduce exposure to unnecessary testing, radiation exposure, cost, and anticoagulation.
Upcoming events

Weekly seminar, 12-1pm, MM5

Jan 9: Natalia Shcherbakova, PhD, MS
Impact of access restriction on use of short-acting prescription opioids in a US health plan

Jan 16: Tim Mader, MD
A contemporary analysis of epidemiology and public health impact of drug related out-of-hospital cardiac arrest in the US

For a full listing of events, see here.

IHDPS in the News

Drs. Spitzer, Stefan, Pack, Pekow, Lagu, and Lindenauer’s recent article about participation in pulmonary rehabilitation (see Publication Summary to the right) received significant media attention. The American Thoracic Society featured a press release, and this was picked up by both EurekAlert and MedicalXpress. Additionally, US News & World Report, HealthDay, COPD News Today, Everyday Health, and MD Magazine all provided coverage of the article. On December 3rd, Dr. Lindenauer was interviewed live about this article for SiriusXM Doctor Radio’s Rehabilitative Medicine hour with Dr. Jonathan Whiteson.

For other IHDPS news stories, see here.

Publication Spotlight:

What was the motivation behind this study?
COPD affects more than 15 million individuals in the US, and hospitalization for exacerbations is a highly morbid event – associated with a high risk of readmission and death that extends for a period of months following discharge. Pulmonary rehabilitation (PR) – a structured program of exercise and self-management support – has been shown to improve the outcomes of patients with stable COPD, and has been recommended in clinical guidelines for many years. PR increases exercise tolerance, reduces dyspnea, and improves overall quality of life. In recent years, there has been growing interest in the benefits of PR in the setting of exacerbations of COPD. Meta-analyses of clinical trials suggest that initiating PR shortly after an exacerbation may help prevent hospital readmission and improve survival. Guidelines now recommend that patients enroll in PR programs within several weeks of hospital discharge. At Baystate, there has been a strong push to refer more patients to PR as part of our COPD QI work, and in support of larger system objectives around achieving value. In this study, we sought to determine how often this goal was being met nationally and to identify factors that might influence an individual’s chance of successfully completing a rehabilitation program.

How did you conduct the study, and what were the main findings?
We obtained the records of all Medicare beneficiaries who were hospitalized for exacerbations of COPD in 2012. We assessed whether patients enrolled in PR programs, and how many sessions they completed if enrolled. We then used multivariable modelling methods to identify patient, hospital, and geographic factors associated with an individual’s chance of participating.

Overall, the study included more than 200,000 patients who were hospitalized for an exacerbation of COPD and appeared to be reasonable candidates for PR. What we found was quite disappointing. In the 6 months following discharge, only 1.9% of patients completed at least one session of rehabilitation; within one year, that number increased to only 2.7%. Among those who made it to at least one session of rehabilitation, the average patient completed a total of 16 sessions. Older patients, women, black and Hispanic patients, and those with lower socioeconomic status were less likely to participate in PR than their counterparts. Distance from a rehabilitation center was also negatively associated with a person’s chance of participation.
How do the results apply to our patients at Baystate, and where do we go from here?

This study suggests that, on a national level, there is a lot more that needs to be done to ensure that all patients with COPD obtain the benefits of PR programs. There are undoubtedly opportunities to increase rates of participation in rehabilitation at Baystate too. To better understand the barriers towards greater enrollment in PR after discharge, we recently interviewed a sample of approximately 15 patients hospitalized for COPD at Baystate Medical Center. We are using qualitative research methods to identify themes that emerge from those interviews in order to develop strategies calibrated towards the needs of our patients – and that have the best chance of working. Based on these interviews we are now planning a pilot study to determine whether pairing patients to a peer coach, someone with COPD who has successfully completed PR, can lead to higher rates of success. Stay tuned.

Population Health Snapshot: How Healthy is Your Community?

County Health Rankings is an initiative funded by the Robert Wood Johnson Foundation. Their annual rankings provide a revealing snapshot of how health is influenced by where we live, learn, work, and play. They provide a starting point for change in communities. County Health Rankings shows how healthy a community is using more than 30 measures, providing an actionable starting point for improving health for all. You can learn more about their approach to measuring health, and why ranking is a helpful starting point to address health disparities, here.

The overall rankings in health outcomes represent how healthy counties are within the state. The healthiest county in the state is ranked #1. The ranks are based on two types of measures: how long people live and how healthy people feel while alive.

As can be seen in this table and accompanying map of the 2018 Rankings, Hampden County ranked last of all 14 Massachusetts Counties for Overall Health Outcomes. One of the drivers for this ranking was the high percentage of individuals in our community who rank their health as fair or poor.

Self-reported health status is a general measure of health-related quality of life (HRQoL) in a population. This measure is based on survey responses to the question: “In general, would you say that your health is excellent, very good, good, fair, or poor?” The measure is modeled and age-adjusted to the 2000 US population. Measuring HRQoL helps characterize the burden of disabilities and chronic diseases in a population. Self-reported health status is a widely
used measure of people's health-related quality of life. In addition to measuring how long people live, it is important to also include measures that consider how healthy people are while alive.

These results are a sobering reminder of the challenges faced by individuals living within Hampden County, reinforcing the salience of Baystate Health's mission to improve the health of the communities we serve, and highlighting the significance of system-wide efforts to address population health – through programs like our two Accountable Care Organizations, four Community Health Centers, and the Public Health Institute of Western Massachusetts.

Recent IHDPS Publications: Oct-Nov


