CAREER DEVELOPMENT PROGRAM IN LEARNING HEALTH SYSTEMS (LHS) RESEARCH

CALL FOR APPLICATIONS

We are delighted to announce that Einstein/Montefiore is among only 11 institutions nationwide to have been awarded an Institutional Mentored Career Development Program (K12) from the Agency for Healthcare Research and Quality (AHRQ) and the Patient-Centered Outcomes Research Institute (PCORI) to support the training of clinicians and research scientists to conduct patient-centered outcomes research within learning health systems (LHS).

The institutions funded under this initiative will produce the next cadre of LHS researchers who have the skill sets to conduct, apply, and implement patient-centered outcomes research to improve quality of care and patient outcomes in a learning health system. Montefiore, as an LHS, supports this K12 program through a Center of Excellence in Promoting Lhs Operations and Research at Einstein/Montefiore (EXPLORE). We are seeking highly motivated, qualified candidates for this 2-to-3 year faculty development program, which comprises active engagement in mentored LHS research and performance improvement projects complemented by an individualized educational program. Candidates from underrepresented groups and those with disabilities are encouraged to apply.

IN ORDER TO BE ELIGIBLE FOR THIS PROGRAM, CANDIDATES MUST:

- Be committed to a career as an LHS researcher;
- Be able to devote a minimum of 75% of your time to the research, performance improvement and educational activities of this program for 2 to 3 years, beginning on January 1st, 2019.
- Be U.S. citizens or non-citizen nationals, or individuals lawfully admitted for permanent residence;
- Have earned a clinical or research doctorate, including, but not limited to: Ph.D., Sc.D., Dr.P.H., M.D., D.O., D.C., N.D., D.D.S., D.M.D., D.N.S., D.V.M., O.D., D.P.M., Eng.D., D.P.T., O.T.D., Pharm.D., D.S.W., Psy.D., or equivalent doctoral degree; and
- Have a full-time appointment at Einstein or in the Montefiore Health System.

APPLICATIONS ARE DUE ON NOVEMBER 19, 2018, AND CONSIST OF THE FOLLOWING:

- A cover page (standard format provided) indicating which project you are applying for and a statement of support from your Department Chair or equivalent supervisor, signed by you and your supervisor.
- A Personal Statement (maximum 2 pages, single spaced, 11 point font maximum, 1” margins) describing your interest in and commitment to a career in LHS research and performance improvement, and why your background makes you well suited for this program.
  - Consider highlighting prior research, performance improvement and/or health information technology training and/or experiences and how these connect to the project for which you are applying
- Your CV; and
- 2 letters of reference highlighting your prior work and experiences related to LHS research and performance improvement.

Note: Qualified candidates may be invited for an interview before selections are made.

SUBMISSION INSTRUCTIONS: all components of the application (including Cover Page Form – see next page) must be compiled into a single PDF document with the file name “Applicant Last Name, First Name_EXPLORE application 2018”) that will be sent by email to nancy.marte@einstein.yu.edu no later than midnight on November 19, 2018.
EXPLORE LHS CAREER DEVELOPMENT PROGRAM APPLICATION

Applicant Name: __________________________________________________________

Institution/Employer: ____________________________________________________

Chair/Supervisor: _______________________________________________________

Chair/Supervisor’s Statement: “I support this application to the EXPLORE K12 program, and encourage this applicant to pursue such training toward developing a career in learning health systems research and performance improvement. I understand that this will require 75% effort committed to this program, and so any other responsibilities (i.e., clinical, teaching, administrative) must be reduced to comprise no more than 25% of the Scholar’s full-time effort before funding from this grant can commence. If a position is offered, I pledge to work with the program directors to meet this requirement, and recognize that a position on this grant will only be granted if those conditions are met.”

SIGNED: _______________________________________________________________

I am applying to participate in the following EXPLORE project (check one box)

☐ Opioid Management  ☐ Sepsis Recognition and Management
☐ Primary Care of Complex Patients  ☐ Spinal Cord Compression
☐ Patient Experience  ☐ Transitions of Care

My Personal Statement, CV, and letters of recommendation can be found on the pages that follow in this document.

APPLICANT SIGNATURE: ________________________________________________

Date: ___________________________________________________________________
EXcellence in Promoting Lhs Operations and Research at Einstein/Montefiore (EXPLORE) Curriculum:

We anticipate that Scholars will have varied backgrounds; thus, we will assess each Scholar’s educational needs upon entry to the program and develop an individualized learning plan based on prior training, experience, and career goals. At the conclusion of the program, all Scholars will have demonstrated excellence in the 7 LHS competencies defined by AHRQ and an additional domain of health equity. Some trainees will be candidates for the 2-yr CRTP (depending on prior training). In such cases, 3 years of total support will be awarded.

The foundation for EXPLORE Scholars’ learning experience is embedding each in a multidisciplinary team addressing a stakeholder-defined, high priority LHS research initiative, selected through engagement with MHS leadership and conducted with informatics support. Throughout their time in EXPLORE, all Scholars and their mentors will meet together in a monthly seminar series to facilitate learning across projects and to provide a forum for some core curriculum elements. These seminars will be conducted using an on-line platform (such as Zoom) to minimize travel between hospitals in the Bronx and Hudson Valley, while maintaining the advantages of face-to-face, real time interaction among Scholars, mentors, and program leadership.

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<thead>
<tr>
<th>EXPLORE Core Curriculum Components</th>
<th>Competency Domain</th>
<th>Course or Group</th>
<th>Setting</th>
<th>Mandatory or elective</th>
<th>Competencies</th>
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<tbody>
<tr>
<td>1. Systems Science</td>
<td>Monthly seminar series; Health system mentor-scholar meetings; MHS leadership forum annually</td>
<td>Monthly mentor/mentee webinar series</td>
<td>Mandatory for all</td>
<td>Understanding structures and function of the health system; using systems theories in LHS research; financial constraints and incentives; assessing the impact of research on equity and value in the health system</td>
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<td>2. Research Questions and Standards of Scientific Evidence</td>
<td>Presentation of each LHS initiative for discussion</td>
<td>Monthly mentor/mentee seminar series</td>
<td>Mandatory for all</td>
<td>Health system engagement for prioritization of questions; critical analysis of evidence of special relevance to health systems</td>
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<td>3. LHS Research Methods</td>
<td>CRTP curriculum, PCOR track (or selected CRTP courses, depending on prior training)</td>
<td>Face to face curriculum offered at Einstein</td>
<td>Mandatory if no prior methods training</td>
<td>Use of appropriate observational, quasi-experimental, or experimental study designs and threats to their validity; theories and conceptual models in project design; use of mixed methods; on-line courses in statistical methods (e.g. instrumental variables, propensity scores, interrupted time series)</td>
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<td>4. Informatics</td>
<td>a) CHDI curriculum b) Clinical Looking Glass</td>
<td>a) monthly seminar series b) synchronous video-based instruction</td>
<td>Mandatory for all</td>
<td>Biomedical and health informatics overview to those who will work at the interface of healthcare and IT; deployment and use of advanced clinical computing in systems of care</td>
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<td>5. Ethics of Research and Implementation in Health Systems</td>
<td>a) Responsible Conduct of Research b) Ethics of LHS research</td>
<td>a) Face to face curriculum offered at Einstein b) Research ethics course of CRTP</td>
<td>a) Mandatory for all b) Mandatory for all</td>
<td>Demonstrate core knowledge of protection of human subjects; knowledge of what activities constitute research vs quality improvement; Knowledge of HIPAA and related requirements; ethical and legal considerations when engaging in multisystem studies</td>
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<td>6. Improvement and Implementation Science</td>
<td>MIPI or CHAM PI course</td>
<td>12-month interactive curriculum</td>
<td>Mandatory if no prior performance improvement training</td>
<td>Models for Improvement, PDSA cycles, Run and Control Charts, Human Factors and Safety, Teamwork, Responding to Adverse Events, Triple Aim, Person and Family Centered Care, Healthcare and Quality Improvement Leadership; scaling up (IHI Certificate in Quality and Safety certificate acquired as part of courses)</td>
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<td>7. Engagement, Leadership, and Research Management</td>
<td>Mentored, stakeholder engagement ‘studio’ for each LHS initiative</td>
<td>Experiential learning with expert faculty support</td>
<td>Mandatory for all</td>
<td>Building stakeholder engaged teams; communication with diverse stakeholders; project management; identification of funding sources</td>
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| 8. Health Equity | a) IHI health equity module  
b) Implicit bias training and structural racism  
c) Addressing equity in LHS initiatives | a) Online module  
b) Workshop (C. Gonzalez)  
c) Monthly mentor/mentee webinar series; Disparities workshop (H. Strelnick) | a) Mandatory if not previously completed  
b) Mandatory for all  
c) Mandatory for all | How to assess multilevel determinants of health and health care disparities when designing studies; participatory methods to engage vulnerable populations; implicit bias |

Selected LHS Priority Projects: Described on the following pages
**Health Systems Approaches to Improving Opioid Management**

This project will apply informatics resources and performance improvement expertise to identify variability in opioid prescribing across the health system, target areas for standardization or improvement, and implement and examine health systems interventions to improve adherence to guidelines for opioid management.

Currently, the US is in the midst of the worst drug epidemic in history and the Bronx has an overdose death rate nearly 50% above the national average. It is imperative to ensure that we are helping, and not compounding, this problem. The overall goal is to reduce unnecessary opioid prescribing, improve adherence to guidelines to reduce opioid risks, and link patients with opioid use disorder to evidence-based treatment.

The Health Systems Mentor for this project is Jeffrey Weiss, MD (Vice President for Medical Affairs) and the Health Systems Advisor is Sharon Rikin, MD, MS (Director of Ambulatory Quality Improvement for the Department of Medicine). The Research Mentor is Joanna Starrels, MD, MS, a nationally recognized expert in opioid management and an experienced mentor.

The Scholar will focus on examining variability in opioid prescribing across the health system, then implement one or two interventions and evaluate implementation and patient outcomes. For example, two high yield informatics-based interventions include: 1) dashboards with embedded clinical decision support to provide guideline-adherent care (e.g., increase use of treatment agreements or urine drug testing); and 2) eConsults for opioid management (e.g., to connect providers with expert guidance on clinical questions like, Does my patient have addiction or just pain? And, How should I taper this patient’s opioids?). Informatics resources will be used to identify variability in opioid prescribing, implement the interventions, and collect data to support quality improvement and outcomes monitoring.

The informatics objectives of this LHS initiative are to: 1) identify variability in opioid prescribing across the health system; 2) create opioid dashboards for departments, services, and providers to present feedback on opioid prescribing compared to peers and national benchmarks; 3) embed clinical decision support within dashboards to promote guideline-adherent care; and 4) create EMR supports for requesting, responding to, documenting, and tracking eConsults for opioid management. The performance improvement objectives are to: 1) reduce variability in opioid prescribing, 2) improve guideline-adherent opioid management, 3) improve access to opioid management experts, and 4) strengthen partnerships and resources to improve guideline-adherent care. The informatics resources developed for this project will be leveraged across the health system to develop and test additional interventions as part of an overall goal to be a leading health system in tackling the opioid crisis and providing the best possible care for patients in the Bronx.
**Risk Stratification and Care Management of Complex Patients in Primary Care.**

This project will apply informatics resources and performance improvement expertise to identify complex patients who are at high risk for hospital admission, readmission, catastrophic decline, or mortality, adapting and evaluating best practices in managing the needs of these populations in primary care.

Montefiore’s primary care system has evolved into an advanced primary care model that promotes team-based care, care coordination, use of data to support population health management, integrated disease management, and engagement of community resources. This project will build on this foundation to develop and implement team-based approaches to identify and address the needs of individuals with complex illness in an effort to reduce healthcare utilization in emergency department and inpatient settings and improve patient experience. The approach will be shaped by the input of primary care team members, patients and caregivers.

The effort will be led by **Health System Mentors, Anna Flattau, MD, MS, MSc** (DFSM Vice Chair for Clinical Affairs) who brings extensive experience with primary care program development and evaluation, and **Urvashi Patel, PhD** (Director of Evaluation and Outcomes Research, Care Management Organization). The Scholar will focus on one or more phenotypes of complexity (such as the frail elderly or patients with behavioral health conditions that are a barrier to medical treatment). Informatics will be leveraged to identify the target population and appropriate data to support quality improvement and outcomes monitoring. Care management strategies will be identified based on best practices and adapted and tested in Montefiore's primary care environment. **M. Diane McKee, MD, MSc** (co-PI of the EXPLORE Center, DFSM Vice Chair for Research) will serve as **Research Mentor**.

The informatics objectives of this LHS initiative are to: 1) identify and validate electronic markers of complexity; 2) pilot actionable data reports for use by care teams; and 3) leverage data registries to build and evaluate targeted collaborations with existing clinical and care management resources (e.g. Health Homes, CMO, DSRIP, and other disease specific programs). Initial performance improvement objectives will be to (1) implement rapid-cycle quality improvement efforts to apply evidence-based practices to the selected phenotype of complex patients (as appropriate for the population, such as reducing adverse effects of polypharmacy in the frail elderly); (2) strengthen partnerships and resources that can improve care for the target population; and (3) define a setting-appropriate care model, based on evidence and adapted to local organizational structure and culture, to support the primary care team in consistently providing best-practice care for the target population. Informatics and care management strategies developed for the target population of complex patients can then be disseminated into other practices of MHS, as well as adapted and applied to other high need primary care populations, including patients with other phenotypes of complex illness.
Understanding, Measuring and Improving the Patient Experience

This project will apply informatics resources and performance improvement expertise to understand current patient experience data and/or improve on patient experience metrics and measurement techniques, while working to improve patient experience for large groups of patients.

Patient experience is a crucial component of healthcare in the 21st century. We must not only provide excellent healthcare to our patients, we must do it in a manner that is accordance with patients’ and their family’s wishes, cultural contexts and interests. Unfortunately, current systems of understanding and measuring patient experience are often inadequate and fraught with bias. It is crucial to better understand what our patients are telling us in current patient experience measurement systems, and at the same time, work to gather patient experience data in novel ways to enhance our conceptualization of what makes for a better patient experience.

It is also unclear how to best improve patient experience across a large medical system, and this project will identify strategies that can be rapidly spread across Montefiore Health System to achieve this goal. The patient experience work can be tailored to any large group of patients across the spectrum of health delivery at Montefiore.

This project will be led by Health System Mentors, Peter Shamamian, MD (Vice President and Chief Quality Officer) who brings extensive performance improvement and patient experience resources to this work, and Maureen Scanlan, MSN, RN, NEA-BC (Vice President of Nursing and Patient Care Services) who is exceptionally skilled at assessing and improving large groups of associates’ patient experience work. The scholar will select a large group of patients (e.g. ambulatory pediatric patients, or gynecologic inpatients, etc.) and focus attention on understanding what drives current patient experience measures and work to improve them as a model for what can be applied across campuses and patient groups. Michael Rinke, MD, PhD (Medical Director of Pediatric Quality and Director of Dissemination and Implementation Science) and Silvie Coleman, PhD (Health Economist at the Network Performance Group) will serve as Research Mentors as the scholar works to rigorously analyze and dissect current patient experience data, and/or develop novel measurement strategies to increase response rates, improve understanding, or develop increasingly relevant markers of patient experience.

The informatics objectives of this LHS initiative are to 1) create novel ways of interacting with patients to garner patient experience data (e.g. My Chart, Get Well Television Network, mobile devices, immediate patient experience machines) 2) prompt frontline caregivers to pursue service recovery when needed based on more immediate patient experience data, and 3) increase daily focus on patient experience for all Montefiore associates. Informatics and care management strategies developed for the target population of patients can then be disseminated into other areas of MHS.
The Montefiore Sepsis and Septic Shock Early Recognition and Management Project

Sepsis is a life-threatening condition caused by a dysregulated immune response to infection that damages the body’s own tissues and organs. Mortality rates of 20-45% have been reported. Survivors may still have to contend with lasting consequences, such as a higher rate of 30-day readmissions, increased risk of infection post-discharge, as well as other physical, psychological, or cognitive disabilities that can affect quality of life. The Montefiore Sepsis and Septic Shock Early Recognition and Management Project aims at providing MHS with the ability to systematically identify and manage sepsis patients as early as possible, while developing a data driven evidence generation framework for optimizing care delivery to improve outcomes, reduce the risk of adverse events, and save lives. This project applies a multi-disciplinary approach to systematically and consistently managing sepsis and septic shock across MHS by leveraging team science, advanced analytics, comparative effectiveness research and outcome improvement.

The project has 3 prongs:

1: Informatics and advanced analytics: In collaboration with the Network Performance Group and CHDI we are developing automated machine learning algorithms to monitor EHR based data, identify patients with sepsis and document earliest sepsis and septic shock time of presentation (ToP), extract clinical, quality, and process data, and generate a dynamic sepsis recognition and decision support system based on a real-time dynamic registry. The dynamic registry will be incrementally optimized to detect sepsis in real-time and serve as an analysis ready, shared data set for infection control, outcomes improvement, comparative effectiveness research, and state and CMS reporting.

2: Outcome Improvement and Infection Control: We will develop a clinical decision support system that takes into account the ToP and risk assessment, best practices and guidelines in sepsis management, infection control, antibiotic stewardship, process improvement, and outcomes improvement to deliver consistent sepsis management strategies and standardized care-paths for sepsis and septic shock patients at Montefiore. The decision support framework will be coupled with ‘Epic Best Practice Advisories’, and other forms of alerting to improve outcomes, deliver the highest quality systematically and consistently everywhere, to reduce non-beneficial and wasteful care, and to reduce adverse events.

3: Clinical Evidence Generation and Continuous Learning: We will comparatively study effectiveness of the analytically driven care paths in improving outcomes and preventing adverse events related to sepsis and septic shock. Principles of re-enforcement learning and continuous monitoring will be used to continuously measure, learn, improve, and generate clinical evidence for performance of the early recognition algorithms, acceptance and utilization behavior of the care providers in response to the decision support framework across MHS, and short and long term outcomes and safety of the analytically driven care paths across different departments and patient communities.

The CHDI/Dr. Parsa Mirhaji will provide the informatics support and mentorship related to design and implementation of the informatics components of the project, The Scholar will be supported by Health System Mentor Theresa Madeline, MD and Research Mentor Michelle Gong, MD.
**Spinal cord compression early recognition and prevention**

Spinal cord compression due to metastases to the spinal column has high morbidity and mortality; it is extremely painful and debilitating for patients, and requires true multidisciplinary management. However, complications can be prevented with early recognition and coordinated care. Barriers to detection and prevention of spinal cord compression include delayed or inconclusive imaging, and clinical markers and physical findings that may raise the index of suspicion are frequently missed or not closely monitored during regular clinic visits.

The Spinal Cord Compression Early Recognition and Prevention project aims to create a data driven decision support framework for coordination and management of cancer patients, to prevent and preempt metastatic Spinal Cord Compression (SCC).

The project has 3 prongs:

1. **Informatics and Predictive Modeling:** In collaboration with the Department of Radiology and Imaging, the Center for Cancer Care/Radiation Oncology, CHDI, and Intel Artificial Intelligence Products Group (AIPG) we are developing, testing, and validating a deep learning (DL) algorithm capable of learning from 2D and 3D images (CT and MRI), clinical notes and reports in free text, and structured biomarkers and EHR-based data. The DL model will be incrementally optimized to detect patients at high risk of developing SCC, and to predict ‘time to event’.

2. **Precision Care Paths for Outcome Improvement:** We are developing a clinical decision support system that takes into account the risk assessment, classification, and ‘time to event’ predictions of the DL model, as well as patient socio-economic, clinical and behavioral characteristics, to conceptualize personalized care management strategies and standardized care-paths for patients at risk for SCC. The precision care paths will be complemented with ‘Epic Best Practice Advisories’, and other forms of alerting and communication (including patient MyChart systems) infrastructure to engage patients early on in their own care.

3. **Clinical Evidence Generation and Continuous Learning:** We will comparatively study effectiveness of the analytically driven care paths in improving outcomes and preventing adverse events for SCC patients. Principles of re-enforcement learning, and continuous monitoring will be used to continuously measure, learn, improve, and generate clinical evidence for performance of the DL algorithm, acceptance and utilization by care providers applying precision care-paths across the MHS network, and short and long term outcomes and safety of the analytically driven care paths across different cancer patient communities.

The **CHDI/Dr. Parsa Mirhaji, MD** will provide the informatics support and mentorship for design and implementation of the informatics components of the project, as well as developing and deploying the clinical decision support frameworks, precision care paths, and continuous learning for clinical evidence generation and outcomes improvement. The Scholar working on this initiative will also be supported by **Health System co-mentors, Shalom Kalnicki, MD, and Judah Burns, MD** and **Research Mentor Chandan Guha, MD**.
**Improving Transitions of Care through Collaboration with Post-Acute Providers.**

This project will apply informatics resources and performance improvement expertise to identify opportunities to systematically improve transitions of care and health outcomes for Montefiore Health System (MHS) patients discharged to post-acute providers.

Montefiore recently completed a rigorous request for information (RFI) process to select an expanded preferred provider network of high performing skilled nursing facilities (SNF) that span the four counties where MHS has acute care hospitals. The goals of the collaborative are to advance care quality, improve care experience, and reduce total cost of care for Montefiore patients being discharged to SNFs. This project will build on this foundation to develop and implement hospital and post-acute initiatives to more effectively and efficiently coordinate services across the continuum and improve transitions of care. The approach will be shaped by the input of hospital, health system, post-acute and population health team members.

The effort will be led by **Health System Mentors, Allison Stark, MD, MBA** (Chief Medical Officer, Montefiore Care Management Organization) who brings extensive experience with care continuum quality improvement and population health efforts, and **Urvashi Patel, PhD** (Chief Data Scientist, Montefiore Care Management Organization). The Scholar will focus on one or more transitions of care interventions, either general or targeted to defined clinical pathways, that are scalable and can improve outcomes including reduced readmission and ED utilization. Clinical Informatics will be leveraged to support quality improvement and outcomes monitoring. **William Southern, MD, MSc** (Chief, Division of Hospital Medicine and Professor, Department of Medicine) will serve as **Research Mentor.**

The informatics objectives of this LHS initiative are to: 1) define care transition clinical pathway gaps with actionable opportunities for improvement; 2) leverage platform technologies providing real time data to pilot specific, targeted interventions; and 3) track performance and performance improvement across care continuum providers. Initial performance improvement objectives will be to (1) implement rapid-cycle quality improvement efforts to apply evidence-based care transition practices to the population of discharged patients; and (2) strengthen partnerships and resources that can improve care and care transitions for the target population. Informatics and SNF transition strategies developed for the target population of discharged patients can then be adapted and disseminated to other components of the care continuum across MHS.