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EXPERIENCE REPORT

Learning Health Systems

The Texas Health Resources Clinical Scholars Program: Learning healthcare system workforce development through embedded translational research

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Abstract

Introduction: Texas Health Resources (THR), a large, nonprofit health care system based in the Dallas-Fort Worth area, has collaborated with the University of Texas Southwestern Medical Center (UTSW) to develop and operate a unique, integrated approach for Learning Health System (LHS) workforce development. This training model centers on academic health system faculty members conducting later-stage translational research within a partnering regional care delivery organization.

Methods: The THR Clinical Scholars Program engages early career UTSW faculty members to conduct studies that are likely to have an impact on care delivery at the health system level. Interested candidates submit formal applications to the program. A joint committee comprised of senior research faculty from UTSW and THR clinical leadership reviews proposals with a focus on the shared LHS needs of both institutions—developing high quality research output that can be applied to enhance care delivery. A key prioritization criterion for funding is the degree to which the research addresses a question relevant to THR as a high-volume network with multiple channels for consumers to access care. The program emphasis is on supporting embedded research initiatives using health system data to generate knowledge that will improve the quality and efficiency of care for the patient populations served by the participant organizations.

Results: We discuss specific strategic and tactical components of the THR Clinical Scholars Program including an overview of the academic affiliation agreement between the collaborating organizations, criteria for successful program applications, data sharing, and funding. We also share project summaries from selected clinical scholars as examples of the LHS research done in the program to date.

Conclusion: This experience report provides an implementation framework for other academic health systems interested in adopting similar LHS workforce training models with community partners.

KEYWORDS
academic affiliation, delivery system science, learning health system, translational research, workforce training

1 | INTRODUCTION: THE NEED TO EXPAND LEARNING HEALTH SYSTEM TRAINING ENVIRONMENTS

The learning healthcare system (LHS) has been defined as an entity "that is designed to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care."[1] Practically, an LHS collects data from routine operations and leverages that information to test hypotheses and garner insights related to the effectiveness, quality, safety, and cost of care. This new knowledge is then applied as part of a continuous innovation and care improvement cycle. Under the LHS model, participating in later-stage translational research thus becomes a core part of delivery organization functions rather than something extant.

Prior to the widespread use of Electronic Health Records (EHR) and its associated extensive creation of health data as a by-product of care, the cost and personnel requirement for the data collection and data management underpinning the LHS was a major impediment to deployment of the model. With the broad adoption of EHRs in the United States,[2] the health data availability prerequisite for learning healthcare systems has been fulfilled.[3] However, many organizations still face substantive LHS implementation challenges, with a key issue being the paucity of a trained workforce that can extract and analyze data, synthesize findings into actionable improvement opportunities, and present information to care team and consumer stakeholders in a relatable fashion.[4-7]

Similar to how homegrown EHR systems were mainly evaluated by a small group of major academic institutions,[8] Lim et al. demonstrated that in general, analytics approaches supporting the LHS model are evolving and being assessed in major academic and tertiary medical centers.[3] Operationalizing as an LHS and training an LHS workforce are time consuming and expensive activities, creating a barrier for smaller health systems and hospitals to fully engage in LHS activities.[9] As 84% of the 6093 hospitals in the United States are categorized as community hospitals,[10] the benefits of the LHS model may not materialize as quickly in these entities. Furthermore, delineating late-stage translational and health systems research as an exclusive domain of academic institutions or tertiary centers precludes arriving at a complete picture of outcomes, processes, and improvement opportunities in delivery settings where most of the US population receives their care.

In response to these LHS workforce and training environment gaps, Texas Health Resources (THR) and the University of Texas Southwestern Medical Center (UTSW) have developed a collaborative, integrated LHS training approach. The model is based on academic health system faculty members conducting later-stage translational research within the setting of a regional care delivery organization. The objective of this experience report is to provide an implementation framework for other academic health systems interested in adopting similar LHS workforce training models with community partners.

2 | METHODS: PROGRAM DESIGN AND OPERATIONAL COMPONENTS

THR is a large, nonprofit healthcare delivery system based in the Dallas-Fort Worth area that has more patient encounters in North Texas than any other provider in the region. UTSW is the North Texas region's major academic health system. THR and UTSW have a long-standing history of collaboration on medical education, research, and care delivery initiatives, including Southwestern Health Resources, a clinically integrated network of academic and community physicians, hospitals, and ambulatory facilities. The THR Clinical Scholars Program represents an extension of that relationship under a formal academic partnership that creates an expanded environment for LHS workforce training. The program engages early career UTSW faculty members to conduct studies pertinent to health systems as researchers with access to THR data and embedded within THR care settings. The guiding principle of the program is to develop and apply the methodologic and analytical skills of the Clinical Scholars on research questions of interest to THR by connecting them with the resources of a high-volume delivery organization as an LHS laboratory. This model has proven mutually beneficial to the partnering institutions. Essential structural and operational elements of the program are described herein.

2.1 | Core LHS activities under an enterprise academic affiliation agreement

To accomplish a broader set of shared medical education and research goals stemming from the THR-UTSW collaboration, the two systems developed an enterprise-level academic affiliation agreement (AAA) in 2016. The primary purpose of the AAA is to advance the THR and UTSW organizational missions on a local, regional, and national level. THR gains access to resources through the AAA that enhance the system's ability to provide high-quality care across a continuum (eg, clinical workforce training, data science, bioinformatics) and augment its capacity to participate in clinical trials and delivery system research (eg, support for translational studies, Clinical Scholars Program). The AAA allows UTSW to extend its reputation in translational, patient-oriented, and health services research by granting UTSW researchers and clinical trainees an avenue to an expanded spectrum of

experiential learning sites, facilitating clinical studies and enabling UTSW to accelerate the build out of a strong program in population health sciences.

The current AAA encompasses five core activities that cultivate the LHS model: (1) graduate medical education (GME); (2) medical simulation training, (3) clinical and translational research services, (4) data science, and (5) the THR Clinical Scholars Program. Activities 3 and 4 are direct facilitators for the THR Clinical Scholars and associated LHS work. The clinical and translational services include development of an Integrated Research Unit that supports a single institutional review board for THR and UTSW investigators and information technology tools to expedite population screening and participant recruitment, among other resources to promote research. The AAA has fostered development of a nationally recognized data science program comprised of disciplines in bioinformatics, clinical informatics, and health services research, among other concentration areas. The data science component of the agreement also supports LHS workforce growth in addition to the THR Clinical Scholars through UTSW-sponsored masters level programs in Health Informatics, Clinical Sciences, and GME training in clinical informatics, as well as recruitment of and resourcing for faculty in these disciplines.

2.2 | Data use and sharing

As a foundational piece for all the AAA activities and vital to the Clinical Scholars Program, THR and UTSW developed a separate master data use and sharing agreement (DUA). The intent of the DUA is to promote efficient access to data of interest from the THR-UTSW collaborative for use in research and operational improvement initiatives with appropriate regulatory oversight. Processes for sharing data were designed for practicality and sustainability with the priority of maintaining patient privacy and confidentiality. The DUA and its associated procedures were vetted through information technology governance, information security, and legal representatives in both organizations. UTSW and THR each have their own data service request processes. Requests involving data from both partners undergo an expedited review, approval, and procurement steps (facilitated by the master DUA) at each institution. The DUA architecture has also allowed construction of common THR-UTSW data repositories, one of which was used recently to develop a prediction model for acute kidney injury in patients hospitalized with COVID-19.[11] Work is underway to expand the content and granularity of these common data repositories, particularly in terms of bringing in historically unstructured EHR data elements into more easily extracted and usable formats.

2.3 | Clinical scholar recruitment

Information for potential candidates at UTSW is available on the program website: https://www.utsouthwestern.edu/education/programs/nondegree-programs/scholars/thr-clinical/. Awareness of the program is also disseminated through clinical research newsletters and UTSW announcements, as well as during regular meetings that UTSW research leaders hold with department chairs. Prior to submission of a proposal, interested faculty members are directed to meet with a senior THR clinical leader (generally at the Chief Medical Officer [CMO] level) at least once to discuss their ideas and develop a project synopsis to vet with other THR stakeholders. The intent of this pre-proposal phase is to ensure fit of the planned work with THR strategic priorities before consuming investigator time and effort required to develop a full application. Additionally, feedback accrued during the pre-proposal assessment can be used to optimize the formal submission.

Notably, UTSW has a current Clinical Translational Science Award (CTSA) funded by the National Center for Advancing Translational Sciences. The CTSA has been complementary to the THR Clinical Scholars as it supports a shared set of resources (eg, an Informatics Coordinating Office) for investigators in either program. The presence of the CTSA permits proposals to be steered to different channels. The THR Clinical Scholars Program emphasizes projects with a more proximal care delivery application, whereas proposals earlier in the translational pathway are likely to be directed to the CTSA.

2.4 | Criteria for clinical scholar awards

Submissions for funding under a THR Clinical Scholar award are typically accepted for consideration every 6 months until the program has reached its full complement under a given budget period. A joint committee of executive leaders from THR and senior research faculty from UTSW reviews applications with a focus on meeting the shared LHS needs of both institutions—developing high-quality translational research output that can be applied and implemented to enhance care. Prioritization for proposals is based on scientific merit and the degree to which the research addresses problems relevant to delivery systems. Additional attributes of successful proposals include research that could be viewed as being embedded in health system operations (ie, would a health system value the work enough to fund it outside of the Clinical Scholars Program?), ability for the research objectives to begin to impact care delivery in a 3-year timeframe, and likelihood of the research to advance the faculty member's scholarly career (ie, future grants and peer-reviewed publications).

2.5 | Clinical scholar funding and support mechanisms

Under the terms of the AAA, UTSW faculty members receiving a THR Clinical Scholar award are provided with 3 years of protected time (typically between 50% and 75% of their full-time equivalent) as well as operational support services and project staff to conduct their research activities. Funding allocated to the Clinical Scholars Program is delineated with a 5-year total budget and an annual maximum funding cap per fiscal year. Suitability for continued funding of an individual project over the three-year cycle is assessed annually by the program review

committee. During periods of active funding, in addition to regular interactions with their UTSW faculty mentor (and the availability of THR personnel to help troubleshoot any issues as they arise), the scholars have twice yearly progress report meetings with a senior THR clinical leader (at the CMO level) to ensure ongoing alignment of the research projects with THR operational and LHS interests.

Supplemental support mechanisms for the Clinical Scholars include data analysts (at both sponsor systems), and access to subject matter experts in biostatistics and research methodology. Lastly, the Clinical Scholars Program is chartered at an organizational level as a core component of the AAA between THR and UTSW with a broad and resilient base of commitment from institutional executives. The program value perceived by these senior leaders promotes sustainability.

3 | RESULTS: AGGREGATE PROGRAM DATA AND PROJECT EXAMPLES

3.1 | General metrics

Through March of 2022, there have been seven named THR Clinical Scholars from varying UTSW departments: cardiology (2), internal medicine (1), internal medicine/pediatrics (1), physical medicine and rehabilitation (1), population and data science (1), and neurosurgery (1). Combined, these individuals have received $1.2 million in NIH funding and $941 125 in other research funding since becoming scholars. The scholars have published 83 papers in their respective fields of translational research during the same period. From a delivery system standpoint, as two examples, THR has used output from the program to help inform strategies around community health interventions and risk stratification for patient populations with chronic diseases. Both THR and UTSW stakeholders view their early experiences as positive, and as a marker of that success, the program was recently renewed for another 5 years of funding. For UTSW, the program has provided an additional incentive to recruit new faculty candidates.

3.2 | LHS research summaries from selected THR Clinical Scholars

3.2.1 | Geoinformatics (Amy E. Hughes, PhD)

North Texas residents face significant health challenges related to their local environment for managing Type II diabetes, asthma, and multi-morbid conditions. Nearly 21% of Texans were affected by diabetes in 2019 (10.9% diabetes, 9.7% prediabetes),[12] and both individual and community risk factors impact management.[13] Air quality in Dallas-Fort Worth has been a persistent issue,[14,15] particularly in the summer when sunlight speeds up the production of ozone from its precursors.[16] In addition to other environmental exposures (eg, substandard housing, allergens, cigarette smoke, and stress), air quality can contribute to excess asthma exacerbations.[17-21] Finally, the prevalence of multiple chronic conditions is rising as the US population ages, and associated care is complex and costly.[22,23] Although programs supporting housing have been shown to reduce the number of ED visits and hospitalizations for homeless individuals with multimorbid conditions,[24,25] the mechanisms driving relationships between complex multi-morbidity management and housing changes remain unclear for stably housed patients. Contextual factors at the patient, provider, clinic, and neighborhood level strongly influence patient health behaviors and outcomes.[26] The EHR is a powerful tool for studying how patients interact with contextual environments at the provider and clinic levels. These interactions can be linked to geospatial datasets to characterize how neighborhood environments create high-risk contexts contributing to poor health[27,28] and to guide future place-based health interventions. Using the address history table as a link to place and her backgrounds in econometrics and geospatial information sciences, Dr. Hughes's work in the Clinical Scholar Program has focused on describing locales in North Texas that represent high-risk environments for Type II diabetes management, asthma exacerbations, and management of multi-morbid conditions. Insights from her project will be used to inform community health initiatives.

3.2.2 | Infectious diseases informatics (Richard J. Medford, MD)

Antimicrobial resistance has been identified as an impending global pandemic, with nearly 5 million deaths attributed to bacterial resistance alone in 2019.[29] North Texas is unique in its footprint of multidrug resistant organisms (MDROs), including carbapenem resistant Enterobacterales (CRE), extended-spectrum beta-lactamase producing Enterobacterales (ESBL), methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant Enterococci (VRE), and nontuberculous mycobacteria (NTM) like *Mycobacterium abscessus*. Dr. Medford is utilizing the THR EHR to create a common data model to facilitate tracking of these organisms and build out a North Texas Antimicrobial Hub. His work also entails developing and implementing community-based risk indices and personalized antimicrobial recommendations for these organisms. The over-arching goal is to create and implement novel and multi-modal point of care clinical decision support tools for providers, clinicians, public health agencies, infection preventionists, and antimicrobial stewardship teams by leveraging geospatial information sciences, machine learning, and whole genome sequencing. This research will impact care delivery through earlier recognition of MDROs and improvement in antimicrobial prescribing.

3.2.3 | Predicting and preventing heart failure (Ambarish Pandey, MD)

Heart failure is a growing public health problem and the most common cause of hospitalization among older adults.[30] Early identification of individuals at risk of developing heart failure is key to its

prevention. The burden of heart failure is particularly high in Texas due to high prevalence of risk factors such as obesity, diabetes, and hypertension. Dr. Pandey and his research team developed a machine learning based risk prediction tool, called the WATCH-DM risk score,[31] to identify individuals with diabetes who are at the highest risk of heart failure. This tool was developed using large trial datasets obtained from the National Heart, Lung, and Blood Institute's BioLINCC repository and validated in multiple external cohorts,[32] including the UTSW EHR dataset. The risk model has since been successfully implemented in the UTSW EHR and is currently being utilized to evaluate whether presenting risk information to outpatient providers can foster the use of evidence-based therapies in preventing heart failure among patients with diabetes.[33] The long-term goal of this initiative is to develop pragmatic and effective EHR-based clinical decision support tools that can promote guideline-recommended therapies for cardiovascular disease prevention among high-risk patients. After completion of the pilot, work will be undertaken to expand the use of the tool for broader use in care delivery sites across the THR network.

4 | CONCLUSIONS

The THR Clinical Scholars Program represents a collaborative endeavor between a regional care delivery organization and an academic health system to expand the LHS workforce. The program is designed to leverage the complementary strengths and resources of each partner organization in a mutually beneficial training model. Based on our experience, the program's structural components and operating processes have been key factors in keeping the research funded pertinent to delivery system needs while also promoting scholarly production. We believe that this framework is amenable to scale-up for other similar care delivery organization-academic health system partnerships to use for LHS workforce training.

CONFLICT OF INTEREST

Drs. Medford, Hughes, and Pandey have had institutional salary and research services support through the Texas Health Clinical Scholars Program. Drs. Peterson and Lehman oversee UTSW programs partially funded through the Texas Health Resources-UTSW academic affiliation agreement. The other authors have no conflicts of interest to declare.

REFERENCES

1. Institute of Medicine (US) Roundtable on Evidence-Based Medicine. In: Olsen L, Aisner D, McGinnis JM, eds. *The Learning Healthcare System: Workshop Summary*. Washington, DC: National Academies Press (US); 2007.
2. Office of the National Coordinator. National Trends in Hospital and Physician Adoption of Electronic Health Records. https://www.healthit.gov/data/quickstats/national-trends-hospital-and-physician-adoption-electronic-health-records. Accessed April 17, 2022.
3. Lim HC, Austin JA, van der Vegt AH, et al. Toward a learning health care system: a systematic review and evidence-based conceptual framework for implementation of clinical analytics in a digital hospital. *Appl Clin Inform*. 2022;13(2):339-354. doi:10.1055/s-0042-1743243
4. Basit MA, Lehmann CU, Medford RJ. Managing pandemics with health informatics: successes and challenges. *Yearb Med Inform*. 2021;30(1):17-25. doi:10.1055/s-0041-1726478
5. Kannry J, Sengstack P, Thyvalikakath TP, et al. The chief clinical informatics officer (CCIO): AMIA task force report on CCIO knowledge, education, and skillset requirements. *Appl Clin Inform*. 2016;7(1):143-176. doi:10.4338/ACI-2015-12-R-0174
6. Detmer DE, Munger BS, Lehmann CU. Clinical informatics board certification: history, current status, and predicted impact on the clinical informatics workforce. *Appl Clin Inform*. 2010;1(1):11-18. doi:10.4338/ACI-2009-11-R-0016
7. Gundlapalli AV, Gundlapalli AV, Greaves WW, et al. Clinical informatics board specialty certification for physicians: a global view. *Stud Health Technol Inform*. 2015;216:501-505.
8. Chaudhry B, Wang J, Wu S, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. *Ann Intern Med*. 2006;144(10):742-752. doi:10.7326/0003-4819-144-10-200605160-00125
9. Dash D, Gokhale A, Patel BS, et al. Building a learning health system: creating an analytical workflow for evidence generation to inform institutional clinical care guidelines. *Appl Clin Inform*. 2022;13(1):315-321. doi:10.1055/s-0042-1743241
10. American Hospital Association. Fast Facts on U.S. Hospitals, 2022. https://www.aha.org/statistics/fast-facts-us-hospitals. Accessed April 17, 2022.
11. McAdams MC, Xu P, Saleh SN, et al. Risk prediction for acute kidney injury in patients hospitalized with COVID-19. *Kidney Med*. 2022;4(6):100463. doi:10.1016/j.xkme.2022.100463
12. Centers for Disease Control and Prevention. *Diabetes Report Card 2019*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2020.
13. Hill JO, Galloway JM, Goley A, et al. Scientific statement: socioecological determinants of prediabetes and type 2 diabetes. *Diabetes Care*. 2013;36:2430-2439.
14. Texas Commission on Environmental Quality. Revisions to the state of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution: Dallas-Fort Worth eight-hour ozone nonattainment area. (TCEQ, 2015).
15. EPA Greenbook: Texas whole or part county nonattainment status by year since 1992 for al criteria pollutants. https://www3epa.gov/airquality/greenbook/phistory_tx.html. Accessed April 18, 2022.
16. Haagen-Smit A. Chemistry and physiology of Los Angeles smog. *Ind Eng Chem*. 1952;44:1342-1346.
17. Gilmour MI, Jaakkola MS, London SJ, Nel AE, Rogers CA. How exposure to environmental tobacco smoke, outdoor air pollutants, and increased pollen burdens influences the incidence of asthma. *Environ Health Perspect*. 2006;114:627-633.
18. Guarnieri M, Balmes JR. Outdoor air pollution and asthma. *Lancet*. 2014;383:1581-1592.
19. Chen E, Miller GE. Stress and inflammation in exacerbations of asthma. *Brain Behav Immun*. 2007;21:993-999.
20. Li N, Hao M, Phalen RF, Hinds WC, Nel AE. Particulate air pollutants and asthma: a paradigm for the role of oxidative stress in PM-induced adverse health effects. *Clin Immunol*. 2003;109:250-265.
21. Mendell MJ, Mirer AG, Cheung K, Tong MY, Douwes J. Respiratory and allergic health effects of dampness, mold, and dampness-related agents: a review of the epidemiologic evidence. *Environ Health Perspect*. 2011;119:748-756.
22. Institute of Medicine. *Living Well with Chronic Illness: A Call for Public Health Action*. Washington, DC: The National Academies Press; 2012.
23. Vogeli C, Shields AE, Lee TA, et al. Multiple chronic conditions: prevalence, health consequences, and implications for quality, care management, and costs. *J Gen Intern Med*. 2007;22:391-395.

24. Wright BJ, Vartanian KB, Li H-F, Royal N, Matson JK. Formerly homeless people had lower overall health care expenditures after moving into supportive housing. *Health Aff*. 2016;35:20-27.
25. Sadowski LS, Kee RA, VanderWeele TJ, Buchanan D. Effect of a housing and case management program on emergency department visits and hospitalizations among chronically ill homeless adults: a randomized trial. *JAMA*. 2009;301:1771-1778.
26. Zapka J. Innovative provider-and health system-directed approaches to improving colorectal cancer screening delivery. *Med Care*. 2008; 46(9):S62-S67.
27. Hughes AE, Tiro JA, Balasubramanian BA, Skinner CS, Pruitt SL. Social disadvantage, healthcare utilization, and colorectal cancer screening: leveraging longitudinal patient address and health records data. *Cancer Epidemiol Biomarkers Prev*. 2018;27(12):1424-1432.
28. Hughes AE, Pruitt SL. The utility of EMR address histories for assessing neighborhood exposures. *Ann Epidemiol*. 2017;27(1):20-26.
29. Antimicrobial Resistance Collaborators. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *Lancet*. 2022; 399(10325):629-655. doi:10.1016/S0140-6736(21)02724-0
30. Writing Committee Members, Heidenreich PA, Bozkurt B, et al. AHA/ACC/HFSA guideline for the management of heart failure: executive summary: a report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *J Am Coll Cardiol*. 2022;79(17):1757-1780. doi: 10.1016/j.jacc.2021.12.011
31. Segar MW, Vaduganathan M, Patel KV, et al. Machine learning to predict the risk of incident heart failure hospitalization among patients with diabetes: the WATCH-DM risk score. *Diabetes Care*. 2019; 42(12):2298-2306.
32. Segar MW, Khan MS, Patel KV, et al. Incorporation of natriuretic peptides with clinical risk scores to predict heart failure among individuals with dysglycaemia. *Eur J Heart Fail*. 2022;24(1):169-180.
33. Electronic alerts for heart failure prevention in diabetes. https://clinicaltrials.gov/ct2/show/NCT04791826. Accessed April 21, 2022.

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