Case Report

Building for the future: the creation of a residency training track to foster innovation through clinical informatics in psychiatry

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ABSTRACT

Early clinical informatics (CI) education provides an introduction to CI methodologies for resident physicians to apply within their boarded specialties. A specialty notably absent from the effort to train residents in CI is psychiatry. We present a novel means of integrating CI exposure into a structured educational track within a psychiatry residency training program. The clinical informatics track at the University of North Carolina Department of Psychiatry is a 3-year, longitudinal experience open to residents starting in postgraduate year 2. To our knowledge, this is the first track of its kind within a psychiatry residency training program.

Key words: education, residency, informatics, psychiatry, curriculum

INTRODUCTION

The passing of the Health Information Technology for Economic and Clinical Health (HITECH) Act in 2009 and widespread adoption of electronic health records created an increased necessity for healthcare providers to understand how to use technology in order to provide, document, and improve patient care.¹ Clinical informatics (CI), the application of health information technology (HIT) to clinical care, is a burgeoning field that provides a scaffolding for physicians and others to provide care in an evidence-based manner. In the era of electronic health record (EHR) adoption and fast-paced evolution of other HIT, having physicians in CI positions at the institution and system levels is necessary to improve patient safety.² Physicians' crucial role in the HIT workforce was affirmed as CI became a new medical subspecialty in 2011.³ The American Medical Informatics Association (AMIA) lists 34 Accreditation Council for Graduate Medical Education accredited fellowship training programs in CI as of 2019.⁴ However, even among CI fellows, few had

prior experience with either computer programming, EHR service, or paid CI work.⁵

Providing earlier exposure to CI for residents across specialties, even those not interested in a CI fellowship, would allow better preparation for a career of inevitable interaction with HIT. A few residency programs have developed and published about CI programs within residency training. The University of California Los Angeles Health system accepted residents across specialties into a CI program that trainees found very valuable.⁶ The Children's Hospital of Philadelphia has developed several CI experiences including an elective rotation and a separate longitudinal experience.⁷ Wake Forest Internal Medicine offers a Clinical Scholars in Informatics pathway, a 2-year program for interested residents after a competitive application process.⁸ Among the specialties notably absent from the effort to train residents in CI is psychiatry.

Psychiatry, specifically, lends itself to the use of technology for assessments (eg, telepsychiatry, mental health mobile applications),

making a curriculum providing exploration of clinical informatics within psychiatry residency training a natural fit. The lack of CI training in psychiatry, and the need for a psychiatry informatics curriculum, was described in 1998.⁹ This previous call to action has gone largely unanswered for over 20 years.¹⁰ Psychiatry is just 1 example, and CI training has still not permeated into all medical specialties at the resident level despite the tremendous need. In this article, we present a novel means of integrating CI into a structured educational track within a psychiatry residency training program.

CASE EXAMPLE

Track formation

The University of North Carolina (UNC) Psychiatry Clinical Informatics educational track was conceptualized in fall 2018 by a group of interested trainees. This was driven initially by an interest in improving clinical workflow and documentation efficiency within the residency program to impact resident wellness. Over time, the need for broader clinical informatics knowledge within Psychiatry was evident, and the focus pivoted to department HIT operations. With no existing trainee champions for CI, an educational track within the residency was considered to maintain institutional momentum and build continuity for ongoing projects. A paradigm for incorporating educational tracks into the general psychiatry residency program had already been established at UNC. Tracks within the general residency structure provide protected time from clinical duties to accommodate specific trainee interests via elective longitudinal curricula. Following a series of proposals to key stakeholders including department leadership, training leadership, and an identified faculty advisor with expertise in HIT, the track was accepted, and funding was secured through the Department of Psychiatry. In January 2019, 3 of the originally interested residents were accepted as inaugural track members for the following academic year.

Residency curriculum and track logistics

The UNC general psychiatry residency is a 4-year training program. Intern year is spent on off-service medical rotations and various inpatient psychiatry rotations. The second year of training is a series of longitudinal ambulatory experiences across 10 half-days weekly. Postgraduate year 3 (PGY3) residents split time between inpatient psychiatry units and psychiatric consultation services. The residency culminates in an exploratory PGY4 year where residents participate in electives and other enrichment and clinical leadership experiences. As described above, educational tracks within the general program have included protected time which fits into the second and fourth years of training.

The UNC Psychiatry Clinical Informatics educational track is an elective, 3-year, longitudinal experience. Interns (PGY1) apply to the track by submitting an application detailing their interests and goals. One resident is accepted yearly for entry into the track. Residents start the track at the beginning of PGY2 and continue through PGY4, fulfilling the newly-created Clinical Informatics Chief role as a PGY4. The track is mentored by an EHR physician champion who was appointed Director of Bioinformatics for the department. [Figure 1](#) provides a visual representation of the residency and track structures.

In order to accomplish the ambitions of the track, trainees and the faculty mentor advocated and were granted 2 half-days a week of protected time for track members during their second and fourth years of residency. This request, 20% of clinical time, mirrors the

time granted for other track programs in the UNC Department of Psychiatry, including research and clinician educator tracks. Additionally, financial resources from the department included in the proposal were crucial to expanding the track beyond just EHR optimization and proficiency to high-level clinical informatics coursework.

Track vision and details

In establishing the educational track, there was careful consideration of the overarching vision. The vision for the CI track is conceptualized as 4 pillars, outlined as follows:

Service

Given its novelty at UNC, the Clinical Informatics track is in a unique position to serve the Department of Psychiatry, as well as the overall academic medical center. This is an emphasis for the track, as support for colleagues is a critical means for addressing provider burnout. Fielding department requests for assistance with various clinical work flows has allowed our group to positively impact trainee and faculty HIT experiences while also increasing awareness about CI and the track itself. The intent is to expand to support data collection and technology consulting within the department. Track members hold regular “office hours” to assist the department of psychiatry with EHR-related questions and staff an informal consultative service for specific HIT questions.

Education

Educational curricula for the track provide progressive learning experiences during protected time. PGY2 trainees are enrolled in an AMIA 10 × 10 online course, Introduction to Biomedical and Health Informatics (through Oregon Health Sciences University). Coursework culminates in attendance at the AMIA Annual Symposium where course participants present a final project. Additionally, members complete Epic Power User coursework and obtain certification. By prioritizing a formal lecture series early in the track experience, trainees are able to learn the fundamentals of clinical informatics methodologies to use for operational projects throughout the remainder of their time in the track. In addition to the internal education curriculum, track members are expected to be informaticians as teachers for other residents and faculty through projects and consults.

Research

Track residents have the opportunity to think through challenges in delivering high-quality and efficient clinical care as well as potential solutions to these problems. As described above, part of the 10 × 10 coursework includes a project, which naturally prompts learners to generate research questions. Within the niche created by combining CI, psychiatry, and trainees, unique research opportunities abound. Track members stay up to date with the clinical informatics literature via a regularly scheduled CI journal club led by the Clinical Informatics Chief.

Quality improvement

The track’s focus on quality and safety spurs quality improvement projects centered on evaluating data and promoting efficiency. The track intends to expand quality improvement projects in collaboration with the department’s quality and safety division in the coming years.

STRUCTURE

Figure 1. Clinical informatics track timeline.

Track competencies

Core competencies for the track were established based on broad categories defined by the Accreditation Council for Graduate Medical Education.¹¹ Torous et al¹⁰ recently described a prototype for how these competencies could be addressed through an informatics curriculum within general psychiatry residency training. The foundation of a trainee's core competencies is enrollment and successful completion of the Oregon Health and Science University 10 × 10 Introduction to Biomedical Informatics Course.¹² Thereafter, trainees' pursuits within the track's 4 pillars serve to enrich knowledge from the 10 × 10 course and allow for further experiential competency-based education and training. The delineation of track members' responsibilities defined by PGY level, progressive responsibility culminating in a leadership role as a chief resident, and graded supervision allow residents to pursue educational objectives in a graduated educational framework. Critical appraisal of outcomes is done on an annual basis when the track members and supervisor review core competencies and the efforts made to meet educational objectives throughout the academic year. In completing this longitudinal educational track, a graduating resident is expected to demonstrate a satisfactory understanding of the basics of clinical informatics, demonstrate practical application of clinical informatics knowledge to psychiatric practice, and incorporate clinical informatics methods into research and quality improvement.

OUTCOMES

In the first academic year of having a formal Clinical Informatics track within the general psychiatry residency program at UNC, members have accomplished many identified goals spanning the 4 pillars. Refer to Table 1 for brief descriptions of a selection of projects to date.

DISCUSSION

To our knowledge, this is the first clinical informatics educational track in a psychiatry training program in the country. As of April, 2020, the track has already enrolled 5 psychiatric trainees as members. Through membership in the track, trainees are provided time to explore clinical informatics and how its methods lend themselves

to needs within psychiatry. Didactic learning, lectures from experts, and journal clubs form the backbone of the educational curriculum, while operational needs within the department provide ample opportunities for service, research, and QI. With an emphasis on protected time for didactic learning early in training and leadership skills as a senior, the track provides graduated educational objectives by year.

Outcomes over the first year of track programming have been encouraging. These outcomes rely on several key elements that have contributed to the track's success. The existence of educational tracks within the residency provided a foundation for how to protect trainees' time. While this was helpful, other departments without educational tracks could rely on a similar overarching vision to highlight the potential benefit of having protected time. Another important driver of the track's success was the level of dedication of the resident group who were willing to put in time to develop the track vision and solicit buy-in from necessary stakeholders. Finding a faculty member with a similarly high level of motivation was also critical to the momentum of the program and establishing credibility with program administration. And finally, the leap from EHR support to incorporating graduate-level clinical informatics learning would not have been possible without financial support from the department.

Looking forward, the clinical informatics track of UNC psychiatry intends to expand our efforts in each of the 4 pillars defined above, prioritizing projects that address wellness, end user experiences, patient safety, and evidenced-based clinical care. While the track curriculum maintains flexibility to absorb new roles and projects, many of the projects accomplished to date will likely become annual learning experiences. Finally, as trainees are enrolled for the totality of the track with a formal structure to rely on, they will have the scaffolding and time to engage in research interests. This will allow research and quality improvement efforts to grow, rounding out the vision for the educational mission.

CONCLUSION

Longitudinal experiences in clinical informatics within a residency training program enrich the training experience and provide opportunities to spread awareness of the field to other clinicians. In the

Table 1. Outcomes

Service

- New department-wide note templates for inpatient and ambulatory services
- Formal naming conventions for templates
- Shared master list of templates and their descriptions
- New decision support tool for trainees to choose appropriate CPT code for an outpatient encounter
- Assistance with new institutional documentation for suicide screening in the inpatient setting
- Contribution to department-specific order set review
- Regular office hours for department CI support

Education

- Completion of 10 × 10 Introduction to Biomedical and Health Informatics by inaugural track members and track mentor
- AMIA national conference and project presentations
- Collaboration with billing specialists for department presentation on inpatient coding/billing
- Department Grand Rounds on “EHR Tips and Tricks”
- EHR orientation with physicians and EHR trainers presenting to new ambulatory end-users
- PGY1 informatics didactic and clinical EHR refresher
- Completion of Epic Power User coursework
- Regular tips and tricks contributions to the “*Informatics Update*” in the weekly department newsletter
- Guest lecture series from informaticians across the health system.
- Regular literature review of current topics within informatics

Research

- Educational track conceptualization, execution, and case report
- Two poster abstracts accepted for the 2019–2020 academic year
 - Using data to combat burnout at the 2019 UNC Wellness Expo
 - Track creation at 2020 American Psychiatric Association Annual Meeting

Quality improvement

- Virtual hand-off system and monitoring compliance with its use
- Hospital-Based Inpatient Psychiatric Services incorporation in discharge workflow with intermittent sampling for compliance (Revised discharge instructions and transition record)
- Targeted EHR efficiency interventions based on EHR generated profiles and post-intervention monitoring

Abbreviations: AMIA, American Medical Informatics Association; CI, clinical informatics; CPT, current procedural terminology; EHR, electronic health record; PGY, postgraduate year; UNC, University of North Carolina,

future, the clinical informatics track expects to remain a valuable asset to the department of psychiatry at UNC as the department continues to build its informatics division. Our ambitions are to continue to build training opportunities for more residents to participate in digital psychiatry initiatives, with tracked residents as the stewards for the field.

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AUTHOR CONTRIBUTIONS

MK and EV designed, developed, and implemented the UNC Clinical Informatics Track from conception through implementation. A Hall contributed to the operations and mentorship of the UNC Clinical Informatics Track. A Hutto and EV drafted the manuscript. MK, A Hutto, EV, and A Hall provided manuscript revisions. All authors approved publication of the final manuscript.

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CONFLICT OF INTEREST STATEMENT

None declared.

REFERENCES

1. HITECH Act of 2009, 42 USC §3011-3018; 2009. <https://www.hhs.gov/sites/default/files/ocr/privacy/hipaa/understanding/coveredentities/hitechact.pdf> Accessed December 1, 2019
2. Safran C, Detmer DE. Computerized physician order entry systems and medication errors. *JAMA* 2005; 294 (2): 178–81.
3. Detmer DE, Shortliffe EH. Clinical informatics: prospects for a new medical subspecialty. *JAMA* 2014; 311 (20): 2067–8.
4. Clinical Informatics Fellowship Programs. American Medical Informatics Association website. <https://www.amia.org/membership/academic-forum/clinical-informatics-fellowships> Accessed December 1, 2019
5. Bell DS, Baldwin K, Bell EJ, 3rd, et al. Characteristics of the National Applicant Pool for Clinical Informatics Fellowships (2016–2017). *AMIA Annu Symp Proc* 2018; 2018: 225–31.
6. Singer JS, Cheng EM, Baldwin K, et al. UCLA Health Physician Informaticist Committee The UCLA Health Resident Informaticist Program—a novel clinical informatics training program. *J Am Med Inform Assoc* 2017; 24 (4): 832–40.

7. Mai MV, Luo BT, Orenstein EW, *et al.* A model for clinical informatics education for residents: addressing an unmet need. *Appl Clin Inform* 2018; 09 (02): 261–7.
8. Internal Medicine Residency Curriculum Overview. Wake Forest School of Medicine website. <https://school.wakehealth.edu/Education-and-Training/Residencies-and-Fellowships/Internal-Medicine-Residency/Curriculum-Overview> Accessed December 1, 2019
9. Huang MP, Alessi NE. An informatics curriculum for psychiatry. *Acad Psychiatry* 1998; 22 (2): 77–91.
10. Torous J, Chan S, Luo J, *et al.* Clinical informatics in psychiatric training: preparing today's trainees for the already present future. *Acad Psychiatry* 2018; 42 (5): 694–7.
11. ACGME Program Requirements for Graduate Medical Education in Clinical Informatics. https://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/381_ClinicalInformatics_2019_TCC.pdf Accessed June 1, 2020
12. 10 × 10 with OHSU: Course Description. <https://www.amia.org/amia10x10/ohsu-course-description> Accessed June 1, 2020