Clinical Informatics Rotation

Faculty Leader(s): Adam Dziorny, MD, PhD

Participating Faculty:

Gregg Nicandri, MD – Orthopedics, Chief Medical Information Officer (CMIO)
Anne Fallon, MD – Pediatric Hospital Medicine, GCH CMIO
Todd Holmquist, MD – Neurology, Associate CMIO
Heather Busick, MD – Pediatrics, Associate CMIO
Heather Reyes, MD, MEng – Pediatric Critical Care, Digital Health
Justin Mazzillo, MD – Emergency Medicine (former Associate CMIO)
Conrad Glebar, MD – Hospital Medicine (Adult)

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Overview: The field of clinical informatics sits at the intersection of clinical care, communications and information technology and the healthcare delivery system. The practicing informatician must use knowledge of clinical health care, along with informatics concepts, to improve patient outcomes, maximize patient safety and promote successful provider – computer interactions.

Elective core content will be tailored to the rotating resident, based on the core content for clinical informatics. These topics include:

- The Discipline of Clinical Informatics
- Clinical Decision Making and Care Process Improvement
- The Health System & Health Information Systems
- Data Standards: Systems, Security, Interoperability and Analytics
- Leadership, Communication, Project and Change Management

Learning Objectives:

1. Understand how the discipline of clinical informatics intersects with and influences the three domains of clinical care, healthcare systems and information and communication technology.
2. Describe the role of a clinical informatician in applying the principles of health informatics in the daily practice of pediatrics.
3. Demonstrate knowledge of the methods of workflow analysis and principles of workflow re-engineering as they relate to the design of effective clinical decision support tools.
4. Compare and contrast clinical data standards and provide examples of healthcare data analytics including an understanding of security regulations.
5. Observe and appraise leadership styles and organizational planning in real-world operational informatics.

Schedule and Location(s):

The rotation will begin with an initial meeting / assessment of the learner's interests and knowledge of health informatics with the faculty leader. We will work to personalize the goals and objectives, including identifying required reading and other required activities. (*Note: You should contact Dr. Dziorny prior to the start of the rotation for this discussion*).
Based on the above discussion of goals and needs, elective activities will include:
- Attendance at informatics committee meetings at URMC to experience practical operational informatics
- Selected readings (see below) of both seminal journal articles as well as relevant book chapters
- Selected videos from a bank of recorded lectures, including Larry Weed's 1971 Grand Rounds on medical documentation, the Workforce Development Program by the Office of the National Coordinator, or CHOP Department of Biomedical and Health Informatics guest lecture series
- Didactic sessions and discussion with faculty on topics of interest, selected from the elective core content

Additionally, it is the goal of the faculty that the resident participates in an informatics project during the rotation. Recognizing that the rotation is only two weeks, we will work to tailor the project to the interests of the trainee and fit within the time constraints. Some examples include:
- Identify components of a clinical documentation template (e.g. handoff, discharge summary or contingency planning), perform user testing and implement the components in an eRecord "sandbox" environment
- Identify the target of a clinical quality improvement project using informatics tools and principles. Develop a project plan, including the workflow specific intervention and metrics to assess success or failure. Note that completion of the project is not expected or necessary during the elective.

Required Conferences (rotation-specific conferences in blue):
- Informatics committee meetings include the Advisory Councils and sub-committees, which typically meet on alternating Wednesday mornings (8a – 9a or 9a – 10a). Prior to the rotation start date, faculty will work with the trainee to identify relevant meetings and conferences during the two-week rotation period.
- Additionally, there will be several required meetings between the faculty sponsor and the trainee, to provide core elective content and discuss required reading selected by the trainee. Optional learning opportunities will provide further meeting times, as discussed below.

	Mon	Tues	Wed	Thurs	Fri
AM	Senior Report 8-8:30	Morning Report 8-8:30	EBM/Grand Rounds 8-9	Intern/Senior Report	Morning Report 8-8:30

				8-8:30	
Noon	Noon Conference 12-1	Noon Conference 12-1	Noon Conference 12-1	Noon Conference 12-1	Noon Conference 12-1

Patient Experiences: There is no direct patient care responsibilities for this elective. This is primarily a reading / learning and project-based elective.

Optional Learning Opportunities:

There are several opportunities to expand the core content of this elective. Note that while an introduction to these opportunities may fit within the two-week elective experience, full exposure to optional learning may benefit from additional time outside the elective. This is done at the discretion of the learner and is not required for successful completion of the elective.

Additional Mentored Formal Coursework

The engaged learner may be interested in working through one or more of the following video or PowerPoint courses. The faculty sponsor will provide the learner with material and time to discuss, as well as an optional project to reinforce this learning:

- Introduction to Biomedical and Health informatics [OHSU Biomedical Informatics Course]
- Data Science for Biomedical Informatics (and an Introduction to R Programming) [U Penn Biomedical Informatics Course]
- Introduction to Machine Learning [U Penn Computer Science Course]

Hands-on Approach to eRecord Optimization

If the learner is interested specifically in Epic (eRecord) build tools available, we will identify appropriate courses from the Epic weLearning Community Library (http://userweb.epic.com). Examples include the "Building …" series, such as "Building SmartText" and "Building SmartLists." For motivated learners who are interested in continuing work beyond this elective, we will discuss the training necessary to obtain "Physician Builder" access and assist with the development of eRecord enhancements. Additionally, for motivated residents, the Physician Power User courses may be appropriate options to dive deeper into the EHR. Additional information on these courses may be found here.

The goals of this optional supplemental experience would be: 1) to gain the technical knowledge and skills in the design and build of clinical content in eRecord; 2) to collaborate with a defined user community (physicians, nurses, ancillary staff) to identify needs and resources; and 3) to contribute successful clinical documentation templates to the URMC clinical content library.

Secondary Use of EHR Data – Organization and Research Questions

For the trainee interested in the secondary use of EHR data for both quality improvement and research, we will work together to define a project that can be appropriately addressed by the resident. The trainee will become familiar with the storage of clinical data in the eRecord system, including the layers of storage (Chronicles, Clarity, Caboodle) and the movement of data from each layer. If a defined project falls under the auspices of research, the faculty will work with the motivated trainee to identify a clinical champion, submit an RSRB application and extract the necessary data for analysis. The trainee will then complete the project, likely outside the scope of the elective, and will work with mentors to identify appropriate forums for disseminating the work.

Required Reading:

Faculty will provide key articles in the field of clinical informatics tailored to the rotating resident's interests, and we will discuss these articles during the rotation. Examples of key articles include:

Ash JS, Stavri PZ, Dykstra R, Fournier L. Implementing computerized physician order entry: the importance of special people. Int J Med Inf. 2003;69(2-3):235-250.

Bates DW, Kuperman GJ, Wang S, et al. Ten commandments for effective clinical decision support: making the practice of evidence-based medicine a reality. J Am Med Inf Assoc. 2003;10(6):523-530. doi:10.1197/jamia.M1370

Han YY, Carcillo JA, Venkataraman ST, Clark RSB, Watson RS, Nguyen TC, et al. Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system. Pediatrics. 2005 Dec;116(6):1506– 1512

Hettinger AZ, Roth EM, Bisantz AM. Cognitive engineering and health informatics: applications and intersections. J Biomed Inform. 2017;67:21–33

Kannry J. Effect of e-prescribing systems on patient safety. Mt Sinai J Med 2011;78:827–33.

Kwan JL, Lo L, Ferguson J, et al. Computerised clinical decision support systems and absolute improvements in care: meta-analysis of controlled clinical trials. BMJ. 2020;370:m3216.

Orenstein EW, Boudreaux J, Rollins M, et al.: Formative Usability Testing Reduces Severe Blood Product Ordering Errors. Appl Clin Inform 2019; 10:981–990

Sittig DF, Wright A, Osheroff JA, et al. Grand challenges in clinical decision support. J Biomed Inform. 2008;41(2):387-392.

Suggested Reading:

Based on identified interests, the learner will be provided additional reading material from a bank of relevant informatics textbooks.