Multidisciplinary Sprint Program Achieved Specialty-Specific EHR Optimization in 20 Clinics

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Abstract

Objective The objective of the study was to highlight and analyze the outcomes of software configuration requests received from Sprint, a comprehensive, clinic-centered electronic health record (EHR) optimization program.

Methods A retrospective review of 1,254 Sprint workbook requests identified (1) the responsible EHR team, (2) the clinical efficiency gained from the request, and (3) the EHR intervention conducted.

Results Requests were received from 407 clinicians and 538 staff over 31 weeks of Sprint. Sixty-nine percent of the requests were completed during the Sprint. Of all requests, 25% required net new build, 73% required technical investigation and/or solutions, and 2% of the requests were escalated to the vendor. The clinical specialty groups requested a higher percentage of items that earned them clinical review (16 vs. 10%) and documentation (29 vs. 23%) efficiencies compared with their primary care colleagues who requested slightly more order modifications (22 vs. 20%). Clinical efficiencies most commonly associated with workbook requests included documentation (28%), ordering (20%), in basket (17%), and clinical review (15%). Sprint user requests evaluated by ambulatory, hardware, security, and training teams comprised 80% of reported items.

Discussion Sprint requests were categorized as clean-up, break-fix, workflow investigation, or new build. On-site collaboration with clinical care teams permitted consensus-building, drove vetting, and iteration of EHR build, and led to goal-driven, usable workflows and EHR products.

Conclusion This program evaluation demonstrates the process by which optimization can occur and the products that result when we adhere to optimization principles in health care organizations.

Keywords
- burnout
- electronic medical record
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Background and Significance

The Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009 promoted the adoption and meaningful use of health information technology (HIT). Despite widespread electronic health record (EHR) adoption in the years that followed, meaningful use was not fully realized. Instead, accelerated EHR implementations coincided with increased clinician workloads and a national epidemic of physician burnout.[1–10] EHR implementation priorities often focus on (1) regulation and compliance, (2) billing and productivity, and (3) organizational growth and mergers. This incomplete focus leads to audits and acquisitions instead of clinician engagement,[11] adequate workflow analysis,[12] or development of national usability standards.[13] Loss of autonomy, negative emotions, increased administrative burden, and changes in workflow and communication were just a few of the unintended adverse consequences (UAC) of EHR implementation.[14–16] It was recognized that "technically defined [EHR] implementation success [did] not ensure maximum physician acceptance and use."[17] Instead, EHR implementation needed to coexist with or be closely followed by EHR optimization.[12,17–20]

Facilitators of EHR optimization include a clear vision, committed leaders and governance, involved physician informaticists (PI), nurse informaticists (clinical informaticist [CI]), dedicated resources, stakeholder engagement, workflow analysis, and ongoing training.[12,17–27] Optimization, variably defined as "maintained attention to the sustained use of the EHR"[17] or "the process that maximizes the benefits and utility of the EHR system,"[18] relies heavily on training and education. Many of these optimization training efforts have been described[28–31]; however, evaluations of more comprehensive, bidirectional optimization programs are sparse.[12]

Software configuration and "intensive process reengineering"[20] require iteration and considerable organizational support. The clinic-specific Sprint EHR optimization process allows for real-time problem-solving and tool implementation unlike the more traditional EHR development process, which can take months and lead to frustrations when asynchronous communication, IT semantics, and IT organizational structures do not match clinical needs. Traditionally, HIT software teams are organized by EHR application (pharmacy, laboratory, mobile, billing) or EHR task (orders, clinical decision support, letters). We elected to study the Sprint process to show the value of viewing requests from the perspective of the clinician or staff member, evaluating clinical efficiency gains to fully comprehend the end goal. We evaluate the multidisciplinary Sprint team approach to more generalized and not module-specific governance that promotes innovative, rapid solutions and reduces the EHR burden on the end user. We try to reduce the "suffering in silence," the unwillingness of clinicians and staff to report EHR concerns, that can lead to burnout.

Adhering to key principles of EHR optimization, University of Colorado Health (UCHealth) developed Sprint, a clinic-centered EHR optimization and training program in 2016. Sprint overlies an existing framework for ongoing health system–wide EHR optimization at UCHealth. The Sprint team delivers completed EHR build and intensive training during brief, onsite interventions in target clinics. We work with ~40 clinics, 600 clinicians, and 600 staff members per year and, to date, we have conducted Sprint events in >110 clinics. We previously demonstrated increased clinician satisfaction, improved teamwork, and decreased clinician burnout with Sprint intervention.[28] In this Sprint program evaluation, we describe and evaluate the EHR request, prioritization, and software development process that is integral to Sprint and compliments our successful training program.

Objectives

The objective of the study was to describe and demonstrate the work products of one EHR optimization program that adheres to commonly recognized key principles for successful EHR optimization.

Methods

Sprint Program Background

The UCHealth Sprint EHR optimization and training team is a high-performing, multidisciplinary team comprised of a project manager (PM), a CI, a PI, and ambulatory-certified trainers and EHR analysts who direct and participate in Sprint events. Whereas Sprints are the most salient component of UCHealth's EHR optimization program, there is also an existing framework for ongoing optimization related to projects, upgrades, and other individual requests. UCHealth is a large, integrated health network, comprising 12 hospitals, >600 clinics, and >5,000 clinicians, who practice in a variety of settings: academic and community, urban and rural, primary care, specialty care, and multispecialty. All clinics utilize one version of the EPIC EHR (version 2020, EPIC Systems, Verona, Wisconsin). The health system implemented EPIC in a rolling wave approach beginning in 2011. Since that time, the organization has at least tripled in size.

Sprint events are 1 to 4 weeks in duration and timing is determined by the number of the clinicians in the practice (20 clinicians = 1 week, 40 clinicians = 2 weeks, etc.) although all staff and clinicians are targeted for training and optimization during Sprint. Approximately every 3 years, clinics have the opportunity to participate in a Sprint, and clinics are selected based on strong medical director and manager leadership, clinician and staff desire for Sprint, and timing of last Sprint relative to current ask. Sprint events are onsite, clinic focused, and facilitated by 1 PM, 1 CI, 1 PI, 4 ambulatory-certified trainers, and 4 ambulatory-certified EHR analysts. Key components of the Sprint program include group training (Kick off training focused on EHR personalization and Wrap up training focused on workflow), 1:1 training, and EHR optimization to address inefficient and problematic clinical workflows. All clinical staff and clinicians are included with the exception of students and residents who are typically excluded due to lack of availability to participate.

The Sprint team employs eight, ambulatory-certified EPIC (Epic Systems) EHR analysts who work in teams of four on each Sprint optimization event. Each of the Sprint analysts

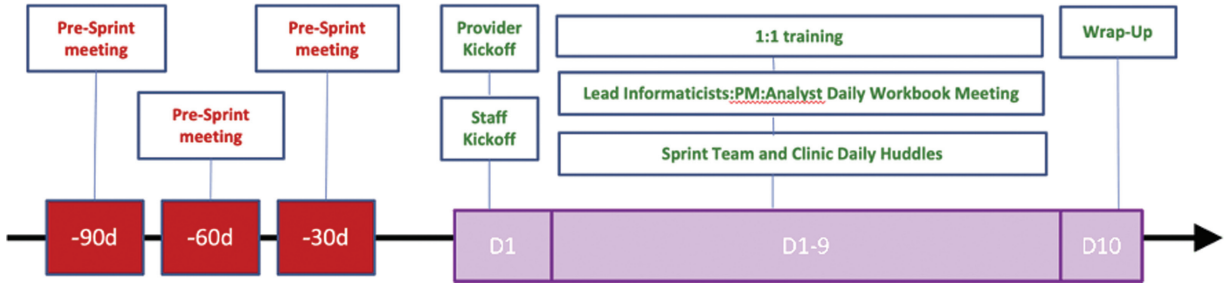

Fig. 1 Clinic engagement and issue reporting begins 90 days prior to Sprint and occurs daily during the Sprint.

also belong to more specific build groups (letters, in basket, orders) within the health system ambulatory EHR team. The Sprint analysts investigate, clean up, repair, and innovate EHR build with direct end-user and clinic-centered feedback. The Sprint PM collects "break-fix" and "new build" requests from clinicians and staff starting with pre-Sprint meetings and continuing throughout the Sprint (►Fig. 1). Break-fix is defined as requests to change existing EHR tools that were either incomplete or not functioning as expected. New build requests include implementation of EHR vendor foundation tools or design of custom tools to address a clinical need. Requests can be initiated and reported to the PM by clinic participants or any member of the Sprint team.

Each request is logged in a clinic-specific Microsoft Excel workbook (►Appendix A) by the PM or the Sprint analysts and these items are reviewed and updated daily during Sprints. In each Sprint, there are two daily workbook review sessions. The first daily workbook review is a 1-hour meeting with the analysts, PM, PI, and nurse informaticist (CI). A second, more focused daily review with clinic and system leadership takes place during the daily huddle, a 30-minute meeting typically held during the lunch hour (►Fig. 1). Typical attendees include the clinic medical director, clinical content leads, clinic manager, charge nurse, lead medical assistant, business supervisor, ambulatory EHR manager/director, and system business/operations representatives.

Workbook items are prioritized through the lens of the clinician and staff, the clinic as a whole, and the larger system because all stakeholders are involved. Priority is elevated when the request is high priority to clinical leaders, concerns patient safety, affects multiple clinic participants or high-volume workflows, and/or positively impacts end users outside of the target clinic. Lower-priority requests include a time-consuming build that does not meet the above criteria and/or which impacts the workflows of only one or a small number of users. If there are too many requests to accomplish during the allotted Sprint weeks, then the PI works with clinic leaders to determine what can be accomplished during the Sprint and what requests will need to be entered as general requests to non-Sprint EHR teams.

Using Agile project management principles,[32,33] EHR build is accomplished by EHR analysts who meet either directly with the requestor or with the PI/CI who has met with the requestor. The build process is iterative throughout the Sprint with clinicians and/or staff reviewing the EHR build and providing real-time feedback. Clinicians have access to the onsite Sprint team to meet face-to-face, but a significant amount of feedback is also received and updated via e-mail during the Sprint. Notably, the CI/PI will help gain support and approval from specialty service lines and EHR governance committees when there are invested stakeholders beyond the participating Sprint clinic.

The build product is considered complete at the close of the Sprint event and further iterations must go through the larger system optimization processes. At the end of the Sprint, the clinic workbook remains with clinic leaders and contains workflow documents explaining new build and critical information about outstanding items and how to follow up (ticket number, responsible team).

Sprint Program Evaluation

For this Sprint program evaluation, four physician informaticists (PIs) and one family medicine resident participated in the retrospective review of 20 Sprint workbooks from UCHealth Sprint events conducted between May 2019 and January 2020. Each PI regularly leads Sprints, actively participates in EHR governance, and has at least 4 years of informatics experience. The family medicine resident reviewer helped design the study and reviewed four workbooks in conjunction with a lead PI. Objective information such as Sprint location, timing, participants, and clinic specialty was collected from Sprint workbooks. Workbook item final status was also noted. To further describe the types of clinical requests, two independent physician reviewers categorized the workbook requests by (1) EHR team with primary responsibility for the request, (2) clinical efficiency gained by addressing the request, and (3) type of EHR intervention needed (►Fig. 2).

EHR team responsible	Clinical efficiency gained	EHR intervention
Ambulatory team	Charging efficiency	Break-fix
Clinical decision support (CDS) team	Clinical review efficiency	New build
Hardware team	Documentation efficiency	Clean-up of existing build
Health information management (HIM) team	In basket efficiency	Vendor enhancement request
Inpatient team	Mobile workflow efficiency	Workflow solution
Interface team	Ordering efficiency	
Laboratory team	Research efficiency	
Patient Portal team	Scheduling efficiency	
Mobile device team	EHR tool accessibility	
Pharmacy team		
Radiology team		

Fig. 2 Categorization of Sprint workbook items by physician reviewers.

The workbook notes indicated which EHR team was ultimately responsible for request resolution.

Determining clinical efficiency gains required evaluating each request for what clinicians or staff attained from the request completed. EHR intervention included break-fix and new build as defined. "Clean-up" items are those directly solicited from clinics and include refining existing build (i.e., removing departed providers from clinic schedule view) to improve accuracy. EHR vendor enhancement requests are items that cannot be built or changed locally without vendor intervention. Finally, workflow solutions translate to training end users on existing EHR tools to enhance efficiency.

Each workbook item was annotated for each of these three measures by the first reviewer and this annotation was unblinded to the second reviewer. The final categorization of each item was determined through discussion by the two reviewers if there was disagreement.

Study clinics were classified as academic if they were staffed by School of Medicine faculty and as community if their clinicians were employed through our affiliate community practice group. A multitude of specialties were represented in this study and included the following: primary care, gynecologic oncology, rheumatology, OBGYN, preprocedural (preoperative) services, physical medicine and rehabilitation, neurosurgery, neurology, interventional pain management, podiatry, orthopaedics, psychiatry, pediatrics, endocrinology, infectious disease, urogynecology, and allergy. The primary care study group included internal medicine, family medicine, and urgent care. The specialty group included single same-specialty medicine clinics. The surgical group included single same-specialty surgery clinics. Multispecialty groups included multiple different specialty and/or surgical clinicians who work together at one practice site.

Results

On average, the Sprint team serviced 30 participants, clinicians ($n = 13$) and staff ($n = 17$), per week of Sprint. Twenty Sprint workbooks, including those from 9 academic clinics and 11 community clinics, were reviewed. A total of 1,254 requests were received from 407 clinicians and 538 staff over 31 weeks of Sprint. ►Table 1 outlines participant demographics and Sprint workload.

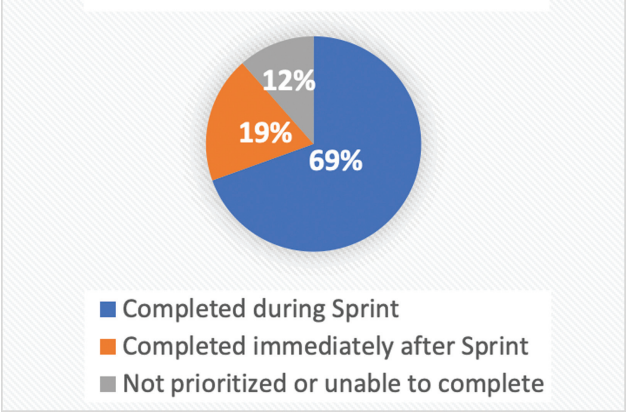

Fig. 3 Outcomes of Sprint workbook requests.

Primary care specialties (primary care and urgent care) requested 26 items per week and nonprimary care specialties (surgery, medicine subspecialties, multispecialty groups, and OBGYN) requested 46 items per week. Overall, 2.1 requests per primary care provider and 3.4 requests per specialist provider were logged during Sprint.

Sixty-nine percent (872/1,254) of all clinic requests were completed during Sprint (►Fig. 3). Issues were considered complete when end users indicated satisfaction with the provided solution. Nineteen percent (236/1,254) of requests required referral to a larger health system governance or other nonambulatory IT teams. These requests were sufficiently vetted and content was fully prepared for build, so the majority of requests were completed within 1 month following Sprint. The remaining 12% (145/1,254) of items were either addressed or redacted by the clinic (52/1,254), determined after joint discussion to not prioritize or complete (35/1,254), or could not be done due to high degree of customization required to complete (58/1,254).

Of the 1,254 total Sprint requests, 46% (571/1,254) simply required modification of existing EHR tools (break-fix and clean-up), 25% (309/1,254) required net new build, and 2% (28/1254) required that the Sprint team ask the EHR vendor

Table 1 Participant demographics and corresponding workbook (WB) requests

	Academic clinics					Community clinics					
	Clinics	Clinicians	Staff	Wk	WB requests	Clinics	Clinicians	Staff	Wk	WB requests	WB requests by specialty (% total requests)
Primary care						3	63	129	5	132	132 (11%)
Urgent care						1	24	45	2	51	51 (4%)
OBGYN						1	11	38	1	42	42 (3%)
Subspecialty	5	134	51	7	364	1	18	26	2	76	440 (35%)
Surgery	4	67	66	7	280						280 (22%)
Multispecialty						5	90	183	7	309	309 (25%)
Totals	9	201	117	14	644	11	206	421	17	610	1,254

Abbreviation: OBGYN, obstetrics and gynecology.

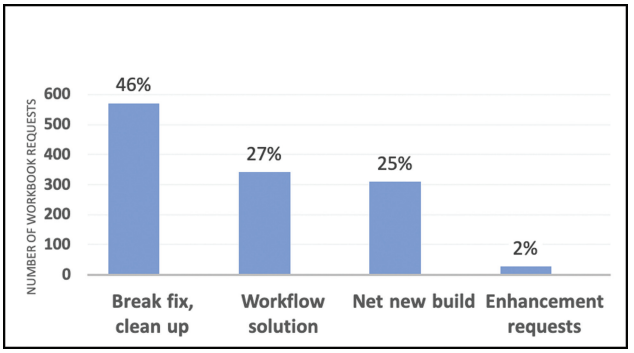

Fig. 4 Type of Sprint intervention required to address Sprint workbook requests.

to work on solutions. Twenty-seven percent (342/1254) of requests required investigation by members of the Sprint team, but the request was satisfied by training on existing EHR tools (►Fig. 4).

To demonstrate the concept of clinical efficiency gains, ►Table 2 outlines representative workbook requests that were satisfied by ambulatory EHR analysts and/or the Sprint training team. A few examples of tool access requests managed by the security team include the following: "I am a clinic manager and I need access to flow sheets," "our advanced practice providers (APPs) are unable to log into the clinical guideline tool through the EHR," and "our social workers cannot access synopsis reports."

Clinical efficiencies most commonly gained with workbook requests included documentation (28% [350/1,254]), ordering (20% [255/1,254]), in basket (17% [217/1,254]), and clinical (chart) review (15% [188/1,254]) efficiency (►Table 3). Typically resolved by security or HIT hardware teams, updated access to existing EHR tools represented 8% (103/1,254) of the clinical efficiency gains. The EHR ambulatory team worked the majority of Sprint requests (47% [590/1,254]), with training (15% [192/1,254]) and security teams (14% [175/1,254]) being the next largest contributors (►Table 3). Requests evaluated by ambulatory, hardware, security, and training teams comprised 80% (1,002/1,254) of reported items and these are typically the items completed during or directly after Sprint.

The specialty groups requested a higher percentage of items that earned them clinical review (16 vs. 10%) and documentation (29 vs. 23%) efficiencies compared with their primary care colleagues who requested slightly more order modifications (22 vs. 20%; ►Fig. 5).

Discussion

When EHR optimization is anchored on business priorities, EHR upgrades, and help desk tickets, the lens of practicing clinicians and staff is overlooked. As a result, optimization of EHR software is suggested by an EHR vendor or a few outspoken individuals and it is followed by usability concerns and increased clinician burnout.[17] Engaging stakeholders, gaining consensus, and analyzing workflows are labor intensive compared with the build and distribution of a vendor-developed EHR upgrade product. With our novel Sprint clinic-centered approach, we authenticate EHR optimization. We adhere to recognized optimization principles[12,17–27] and move beyond training alone using Agile project management to analyze workflows, configure software, and decrease EHR burden.[28] In Sprint, we create a burning platform, lead with compassion, facilitate and support change, and set high expectations for stakeholder engagement. By focusing EHR optimization on usability and clinical efficiency gains, the impact locally and at the system level is measurable and informs HIT processes and priorities.

Sprint clinic-specific optimization relies on direct face-to-face interaction with a high number of clinicians and staff. Operational leaders, medical directors, content experts, and super-users build consensus around clinic requests for workflow optimization and software configuration. These requests are tracked by Sprint PM and vetted and prioritized by the clinic with direct guidance from physician and nurse informaticists and ambulatory EHR analysts. The majority of requests (88%) are completed during or directly after Sprint is completed so trainers and informaticists can provide at-the-elbow education during the Sprint on all new or updated tools. Unique to clinic-centered optimization is accountability, which is important when issues are incomplete, inaccurate, or deserve special recognition. The Sprint team coexists in the clinic, so discussion, apologies, and gratitude are directly expressed. This process improves the IT–clinic relationship by creating empathy and understanding between EHR analysts, staff, and clinicians. One medical director noted:

"The Sprint was absolutely amazing! So helpful in every way possible. It helped all of our disciplines (doctors, advanced practice providers, social workers, chaplain, nurse, schedulers, etc.). We received extremely practical and doable tips, concepts, workflows, etc., every day. It gave our team members hope that the system cared about them, wanted things to be easier, and less burdensome. [We] gain[ed] clinically relevant knowledge, and made things so much better than where we started."

The traditional "squeaky wheel" effect that occurs with traditional help desk processes is less apparent as recommendations and decisions are made and workflows converge at the clinic level.

Conceptually, our "squeaky wheels" are advantageous because they are Sprint informaticists and analysts who participate both in Sprints and in system governance. During Sprint, these individuals share new ideas and build with colleagues. After Sprint, they bring recommendations to system governance for role- or application-specific innovations that provide benefit to the larger health system. For example, documentation-focused requests are often unique to specialty and role; thus, they are typically created for specific users. Alternatively, in basket requests are often application specific and tool access requests are often role specific. Thus, a solution that provides innovative in basket functionality is slightly delayed in system governance after Sprint, but then it is implemented for everyone in the health

Table 2 Representative examples of most common Sprint workbook requests and categorization

	Ambulatory team	Training team
Charging	"Our charge list is too long; can it be shortened to only include what we do in our clinic?"	"How do you create favorites for charges?"
Clinical review	"We need our own synopsis report for interventional pain, because the general pain synopsis doesn't include our procedures" "This synopsis report is too long and requires too much scrolling! Can synopsis report sections appear collapsed by default?"	"Is there a way for me to more easily find labs relating to my specialty?" "Too many scanned results live in the media tab and we have to hunt and peck to find them; they don't align with other testing sections (radiology, labs, etc.)" "How can I rearrange the problem list so I see my specialty-related problems on top?"
Documentation	"We need custom note templates for new and return spine patients" "Menstrual history section looks different for providers and staff and the information in each does not communicate with the other" "The links you built for BMI and LMP don't work, even though that discrete data are available in the chart" "Can we add the Hoffman exam to our physical exam template?"	"We would like the MA to populate the provider note with patient-entered HPI/ROS/annotated images; do they need special security to do so?" "Why don't we all get those special Dragon (speech recognition) microphones?" "Add SCORAD (allergy) flow sheet to the EHR" "Add link to bring Asthma Control Test information into the provider note"
In basket	"Why can't my patients find me to send a message through the EHR?" "Unable to close two open encounters, erroneous smartset (existing workflow for this) did not work" "My in basket messages are going to the wrong pool (group)! I work in 3 different clinics and need the patient messages to route to the clinic where I saw that patient" "Dr. T reports office notes are not auto-routing to referrers"	"How can we change from paper surgical case requests and send them to our schedulers in a way that we can find those messages later?" "What is the fastest way to tell when a patient has the next appointment in my clinic from in basket?" "Providers would like to have 'reply' and 'reply all' arrows on every in basket message type"
Mobile	"We need to add low back pain questions to the existing neck pain questionnaire for new patients" "Dr. W requested that we add insurance status to summary report in EHR mobile application"	"When Dr. Y uses Haiku, he gets an error message; does license need reactivation?"
Ordering	"Why do I need to look in the (scanned) media tab for outside labs and can't see them in the labs section of chart review?" "All orders with CT INJ should have a synonym of guided" "Provider X signature is not showing when printing or reprinting orders"	"We need an orders preference list that is designed for our specialty" "Patch testing workflow is difficult; can we improve ease of ordering?" "Provider X notes that he gets a "pop up" that he cannot get past when trying to order pain injections"
Research		"Can we create a referrals report?"
Schedule	"Nurses X and Y need to be added as schedulable resources for AMC pain and spine clinic"	Newer staff need assistance with scheduling at different clinic locations

system who uses that EHR application. User requests indicating lack of access to an existing EHR tool are similar in that the Sprint team typically finds that all users in that same role are also lacking the requested tool. Order-based requests can benefit one clinic (e.g., build a new department order preference list) or many clinics (e.g., add creatine clearance to the chest computed tomography [CT] with contrast order). In each of these examples, our Sprint team members, our desired "squeaky wheels," proactively scale usability and innovation that augments our traditional, more reactive approach to help desk–based EHR optimization.

For this evaluation, we categorized Sprint requests as clean-up, break-fix, workflow investigation, or new build. Given that 15% of requests required software clean-up only, it is possible that health care organizations could reduce EHR burden by consistently prioritizing EHR clean-up on a regular schedule creating a push intervention rather than a pull. Similarly, adding clinical knowledge to our user provisioning team (i.e., determines which EHR template is seen by which role) and ambulatory EHR teams could help prevent 8% of the clean-up requests that involved lack of access to an existing EHR tool. We also determined that measuring net new build alone significantly underestimates the contributions of the software analyst to overall EHR optimization efforts. Of the total 1,254 Sprint requests, only 25% of requests required novel EHR build, but an additional 73% required technical investigation and/or solutions. Our evaluation suggests that workflow investigation and software clean-up are more time intensive than net new build. Fortunately, with Sprint, clinical end users are present and engaged and Sprint leaders can assist analysts with some of this work.

Sprint physician informaticists actively practice in outpatient clinics. Thus, the Sprint team leaders understand that "there are special challenges with the ambulatory setting"[17] and that "the same [EHR] application has to support different users who work in different contexts to accomplish distinct goals."[34] The Sprint team supports these unique goals while also capitalizing on the clinical expertise and workflows of a

Table 3 Number of total workbook requests categorized by clinical efficiency gained and by the electronic health record (EHR) application teams assigned

	Documentation	Ordering	In basket	Clinical (chart) review	Tool access	Schedule	Charging (billing)	Research	Mobile device	Total requests assigned to each team
Ambulatory team	247	93	102	127	14	4	1	1	1	590
Clinical decision support team		1		3				1		5
Hardware team	9	18	1	1	14	2				45
Health information team				1						1
Inpatient team	3	1			1	1				6
Interface team		2	1	1	1	1				6
Laboratory team	1	13	1	16						31
Patient portal team	10	2	30	2						44
Mobile device team	1		1	2	3	1				8
Pharmacy team		19	1	2						22
Radiology team	2	12			2	3				19
Reporting team				2		1		10		13
Revenue team		1		1	1	2	27			32
Scheduling team	1	4		4	2	47	4	3		65
Security team	9	24	67	7	61	3	3	1		175
Training team	67	65	13	19	4	16	2	3	3	192
Total requests by clinical efficiency (% total)	350 (28%)	255 (20%)	217 (17%)	188 (15%)	103 (8%)	81 (6%)	37 (3%)	19 (2%)	4 (0.03%)	1,254

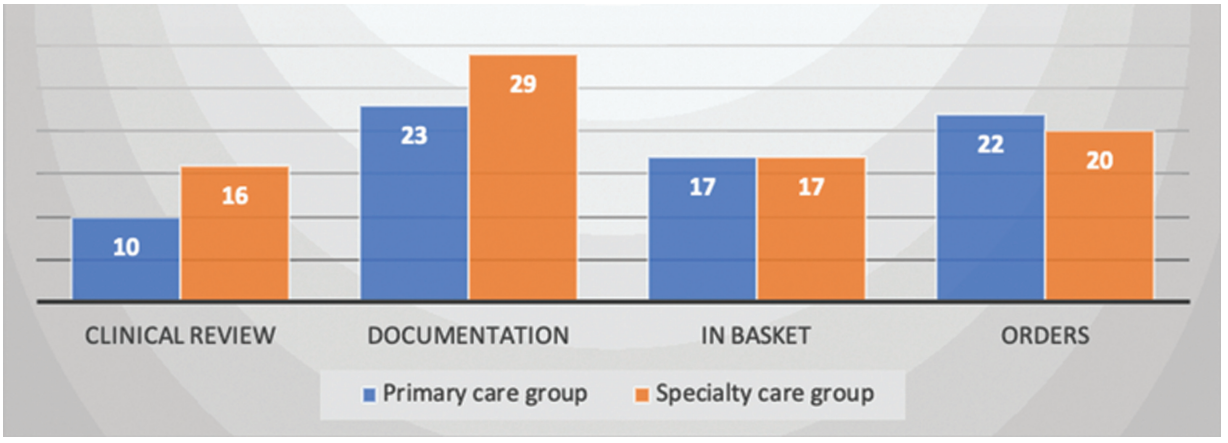

Fig. 5 Percent of total workbook requests primary versus specialty care.

variety of clinical groups. For example, specialty clinics often champion the creation of disease-specific summary reports during Sprint. Since primary care clinicians treat or co-manage similar diseases, they are introduced to these reports during their Sprints. A similar impact can occur between specialties. For example, gastroenterologists may not prioritize a metabolic bone disease report, but if the report was introduced to them, they would use it to follow bone health in their at-risk patients with inflammatory bowel disease. Our data support this observation that primary care benefits from specialty build in that primary care groups request a lower total number of items during Sprint. Specialty clinics also request more custom note templates (documentation efficiencies) given their inherently limited scope compared with primary care. In contrast, the Sprint team capitalizes on the cohesive, team-based workflows of primary care and spreads these core ideas in specialty Sprints.

Optimization is variably defined in the literature and by health care organizations. Therefore, the process and impacts of optimization require continued study.[16] In our published research on Sprint training, we showed increased user satisfaction, improved teamwork, and decreased EHR burden after Sprints.[28] In this program evaluation, we describe how we implement the key principles of EHR optimization to innovate bidirectionally to achieve optimization that positively affects individuals, clinics, and the organization as a whole. We

overcome the IT productivity paradox (i.e., simply increasing investments, without clear guiding principles and end points, which can lead to worsened productivity) with a commitment to and investment in EHR training, EHR build, and process redesign.[20] Sprint user-focused innovations and designs regularly feed into a health system governance process designed to benefit the larger clinician and staff community.

Limitations

It is difficult to compare the yield of our prior, more traditional, institution-wide, "help desk"–driven EHR optimization process to the yield of our clinic-specific Sprint EHR optimization process for several reasons. Our institution has grown exponentially over the past 10 years and, therefore, it is impossible to produce a static yield for comparison. A status of done is also defined differently by our help desk (i.e., request completed or user did not respond to outreach) than by the Sprint team (i.e., end user signs off on every solution). In addition, we track help desk tickets and other requests by completion status only and clinical efficiency gains are not tallied. Break-fix and new build are almost universally prioritized before EHR "clean-up" in the traditional optimization model and thus a status of "clean-up" is not measured for comparison. Finally, help desk calls can often be solved with training and most of the Sprint training effort is not tracked within our workbooks.

Training is integral to Sprints and frequently issues are solved with training before they can be added to the Sprint workbook. We have not made an attempt to capture every training solution because collecting this information would sacrifice time spent assisting end users. Thus, the Sprint workbook requests that were solved with training are certainly an underestimate of total training effort. Instead, they represent issues that our trainers or informaticists were not able to solve immediately without dedicated time to investigate. In these instances, the investigation process and solution are tracked to completion in the Sprint workbook.

Generalizability to smaller institutions without adequate funding to support a Sprint team is difficult. We believe the strength, experience, and camaraderie of our team members are more important than the total number of individuals, but our large team does allow us to create a burning platform and move swiftly yet meaningfully through clinical areas. It is also difficult to generalize about particular specialties when we did not include a large number of clinics representing a single specialty.

Conclusion

This program evaluation demonstrates an EHR optimization process that successfully adheres to ideal optimization principles for health care organizations.

Clinical Relevance Statement

Key principles of EHR optimization are well described in the literature, but descriptions of EHR optimization programs and processes are sparse. This evaluation highlights the work products and experience of one comprehensive and long-standing program at a large, integrated health network.

Multiple Choice Questions

1. What do ideal EHR implementation, upgrade implementation, and optimization processes have in common?
   a. They require stakeholder involvement.
   b. They require training and education.
   c. They require clinical expertise.
   d. They require a focus on usability.
   e. All of the above.

   Correct Answer: The correct answer is option e. EHR implementation, upgrades, and optimization exist as a continuum. Health care organizations are forever growing, merging, and changing, but the key principles behind a successful interface between the EHR team and health care team over time are the same. The most usable, efficient and successful solutions occur when we adhere to these principles, in addition to insuring committed leaders, dedicated resources, a clear vision, and a strong clinical informatics team.

2. How do Agile project management principles help promote improved EHR optimization processes?
   a. Agile takes away the need for a PM.
   b. Agile promotes clean workbook request tracking.
   c. Agile supports product iteration during software build.
   d. Agile provides team-building strategies for multidisciplinary teams.

   Correct Answer: The correct answer is option c. Agile project management is key to EHR optimization because Agile promotes direct interface with the issue requestor, respecting and incorporating their feedback into the final EHR build product or workflow solution. In addition, unlike traditional "helpdesk" optimization processes, the product or solution is not complete until a two-way conversation is had between the requestor and the person satisfying the request. Oftentimes, helpdesk tickets are closed by an IT staff member working remotely, and the solution is not sufficient or agreed upon by the end user.

Protection of Human and Animal Subjects

The Colorado Multiple Institutional Review Board reviewed this study which qualified as exempt. No human subjects were involved in this study.

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Conflict of Interest

None declared.

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Appendix A Sprint standard workbook tracking

Column	Column definition and purpose	Column categories
Subject	The clinical efficiency or the electronic health record (EHR) build team that will address an end-user request. Allows sort for similar requests and helps avoid duplicate entries	Cadence (scheduling), care everywhere (outside records), charging, clean-up, clinical decision support, documentation, Dragon (speech recognition), flow sheets, Haiku/Canto (mobile applications), in basket, inpatient, interface, letters, My Health Connection (patient portal), navigator, Orders -Imaging, Orders-Labs, Orders – Medications, Orders-Referrals, printing, patient-entered data, reports, secure chat, security/tool access, smart tools, synopsis (disease-specific reports), telehealth
Priority	Determined primarily by the physician informaticist (PI), priority determines order of work completion	*High priority:* 1. Patient safety concern 2. Good evidence to support loss of clinical revenue directly due to EHR workflow/tools 3. Clinic prioritized these 1–3 items for this Sprint (not applied if they prioritized >3 items as high) 4. Request provides significant benefit to providers/staff in this clinic but would also benefit the larger provider/staff community if this was fixed/improved *Medium priority:* 1. Items that will improve "quality" of patient care or are current QI projects within the clinic 2. Items that have a clinic champion and are more likely to be used and maintained as a result 3. Subspecialty workflow important to one subgroup of staff/providers but not entire clinic staff/providers (i.e., epilepsy flow sheet, lupus express lane) 4. Items that improve the efficiency of multiple individuals in the clinic 5. Items that provide some benefit to this clinic and also would benefit other clinics 6. Items that allow the individual or subgroup to use standard tools (synopsis, problem list, ordering, edit/share/co-sign notes, Dragon, smart tools, charging) *Low priority:* Items that do not fit into high or medium priority
Requestor	Clinician, staff, or operational leader who placed the request. Promotes understanding of request and ability to close the loop with action taken	N/A
Request details	End user request in their words	N/A
Daily updates	Dated entries updating the Sprint team on when investigation, discussion, and action have been taken on a request	N/A
Sprint owner	The Sprint team member who is taking the lead on an item	N/A
Status	Status indicates where the request is in our queue. A temporary status is applied until a final status can be selected. All workbook items have a final status at the end of the Sprint event	**Final status includes the following:** *Clinic-owned:* workflow that needs further evaluation or education or clinic does not prioritize during Sprint *Done:* request was completed during Sprint *Not doing:* request was not completed during the Sprint and a ticket was not placed to have this item completed **Temporary status includes the following:** *CI/PI owned:* a PI or nurse informaticist will see the request through to completion. Analyst is not needed *Parking lot:* request has not yet been prioritized or assigned to an owner *Ambulatory prioritization and optimization meeting (PROM)*: request will impact additional stakeholders beyond this clinic/specialty and will be brought to our weekly ambulatory EHR governance meeting for decision *To do- researching*: request is being investigated

Appendix A (*Continued*)

Column	Column definition and purpose	Column categories
Necessary discussion	Discussion outside of the Sprint team is needed	Daily Sprint Huddle, PROM
Handoff team	Request needs to be completed by another team with a different skill set or governance structure. Training team items are moved to a separate workbook tab and addressed by the Sprint trainers	Integrated orders, beaker (laboratory), cadence (scheduling), interface, MHC (patient portal), security, training, virtual health, willow (pharmacy)
Analyst tracking task#	An internal system used to track time spent by Sprint analysts on workbook requests	N/A
Ticket#	Number assigned to track build requests in or out of Sprints	N/A
Build buddy	The analyst that reviews build of another analyst before validating build with an end user or PI/clinical informaticist (CI)	N/A
New build doc	Reminder to analysts to add new build to the build document that is left with the clinic after Sprint	Yes, No
Workflow doc	Reminder to analysts to add new workflow information to the workflow document that is left with the clinic after Sprint	Yes, No
Tip sheet	Reminder that tip sheet needs to be created for a workflow or tool	Yes, No
Training Wiki	Reminder to the training team to add an important new tool or workflow to our 1:1 training for this clinic	Yes, No
Wrap up doc	Reminder to PI/CI that this important tool or workflow needs to be demonstrated during wrap up group session	Yes, No