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In-Basket Teamwork: Divide the Work and Multiply the Success

The Registered Nurse Role in Ambulatory Clinic EHR In-Basket Management

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Abstract

Electronic Health Record (EHR) in-basket results (e.g., lab results, pathology reports, etc.) must be reviewed and acted upon in a timely manner by clinical staff in order to provide safe and effective care to ambulatory patients. Delays in reading results are significant contributors to medical errors. A large backlog of in-basket results that have never been appropriately filed is both a safety concern and a symptom of other clinical workflow issues. EHRs have shifted a greater proportion of administrative and triage roles onto providers, contributing to provider burnout. This paper synthesizes some of the best evidenced-based practices available for the management of provider in-basket results to address the in-basket results backlog at a large, tertiary medical center. The framework outlined is intended to provide concrete recommendations. However, it is intentionally broad so that it can be applied to any of the 200+ diverse clinics of the Medical Center, regardless of specialty or clinic structure. The framework emphasizes collaboration and utilizes registered nurses as part of the clinical team to improve the safety and efficiency of the process. Nurses serve a unique function because their critical thinking skills and broad scope of practice bridge the gap between providers and medical assistants (MAs). By using the plan, do, study, act (PDSA) cycle and gradually expanding the nursing role, more effective clinical teams can be built to meet the needs of both clinicians and patients.

In-Basket Teamwork: Divide the Work and Multiply the Success

The Registered Nurse Role in Ambulatory Clinic EHR In-Basket Management

One of the key provisions of the Health Information Technology for Economic and Clinical Health Act (HITECH) and the Affordable Care Act (ACA), which were enacted in 2009 and 2010 respectively (U.S. Department of Health & Human Services, 2009; U.S. Centers for Medicare & Medicaid Services, 2010), is the “meaningful use” of electronic health records (EHR). Although EHRs predated the ACA, their use proliferated after its passage. Epic, one of the most widely used EHRs in the United States, was launched in 2011 as the primary EHR system at a large tertiary medical center in the San Francisco Bay Area (“Medical Center”). Like most health systems, the Medical Center’s ambulatory clinics have struggled with the burden of the tasks that the EHR demands. A common theme in many healthcare systems, large and small, is the disconnect between the natural clinical workflow and the workflow of their EHR.

This project aims to provide assistance bringing the clinical and EHR workflows into better alignment and to provide tools for more efficient in-basket processes. This project has been designed as a framework that is broad enough to be applicable in a wide range of clinics, and customizable to fit their specific circumstance. One central component of this proposed process is the role of nurses on clinical teams. With greater teamwork, it should be possible to relieve some of the burden on specialist within ambulatory clinics, helping to address the rising problem of provider burnout. It should be possible at the same time to provide more patient-centered care by leveraging the skills of nursing staff.

Statement of the Problem

While EHRs have produced many benefits that will not be examined in this paper, they have also resulted in a tremendous new burden on providers. Shah et al. (2019) found that 70% of primary care providers say that the number of in-basket messages is “overwhelming,” with a mean number of 128 notifications per provider per day. The more than 190,000 results that remain in the Medical Center’s provider in-baskets as of November 2020, years after receipt, demonstrate the need for a change in workflow to better handle these notifications.

In addition to establishing a policy to handle the backlog and prevent reaccumulation, a plan is needed to improve EHR results in-baskets workflows across the macrosystem. What workflow changes can be implemented with a minimum of EHR customization, to reduce this burden, promote more effective use of providers’ time, and improve patient-centered care? Can nurses play a key role in responding appropriately to these results? What steps do individual microsystems at the Medical Center need to take to address this issue, while fitting the unique circumstances of their specific clinics?

History of the In-Basket Results Backlog

In 2011, the Medical Center implemented a customized version of Epic, with an intensive, system-wide training effort, to prepare providers for the transition to the new EHR. Despite the customization and training that accompanied the roll out, discrepancies remained between three key aspects.

1. The intended EHR workflow
2. The actual EHR workflow that resulted when healthcare workers began using the system
3. The traditional clinical workflow

An apparent lack of user understanding and familiarity with the system, combined with user interface issues, created an unanticipated problem with the system's "results in-baskets." In-baskets were intended to draw user attention to new results, in much the same way that a paper printout of a lab result might have in the era prior to EHR implementation. In-baskets were not designed, nor intended, to be used as a storage location or place to reference important results. However, that is how it appears many providers used their results in-baskets. Anecdotal evidence from providers indicates that many of them regarded these in-baskets the same way that many people treat their email inboxes. Given the virtually limitless capacity of electronic in-baskets or inboxes, providers were disincentivized to remove items from the in-basket once the result had been addressed. Other providers have stated that they intentionally left results in the in-basket for easy reference. The consequence of these behaviors is that they create no record of the result having been reviewed or acted upon.

Although chart reviews indicate that the vast majority of these in-basket results were appropriately addressed, they were never checked off as "done" or "reviewed." As a consequence, these results continued to accumulate in many providers' in-baskets for years. As of November 2020, 190,000 results remained in in-baskets of providers throughout the Medical Center.

Epic has a broad range of in-basket categories that cover both in-patients and ambulatory patients. Within ambulatory in-baskets, folders include community messages, chart completion messages, e-consults, and many other categories. For the purposes of this project, the focus is only on ambulatory in-basket results. Further subdividing these results, the majority of the remaining results fit into three main categories:

- Lab results
- Pathology reports
- Radiology reports

Unlike paper charts, links within EHRs can make a file appear to be in more than one place at the same time. This may contribute to the misapprehension that removing a file from the in-basket will delete it. This is not the case. Instead, marking an in-basket result as complete documents that it was read. The intention of the in-basket was that it would mimic a physical in-basket, where result would be reviewed and then shifted to an “out-basket,” so they could be filed. The EHR analog of “filing” the result is the provider clicking either the “reviewed” or the “done” buttons.

Some providers may not have understood or been clearly trained on this intended workflow and simply left results in the in-basket after they were reviewed or done. Other providers seem to have thought of the in-basket as a place where they could reference important results. In practice, this is not a safe or efficient way to “store” results. When a provider clicks “done” or “reviewed” the results are not lost. They remain a permanent part of the patient’s electronic chart and can more easily be organized and searched from there, than from the in-basket. Some providers may not have been clear on this foundational concept. Others may simply never have been become familiar or comfortable with other mechanisms that the system provides for referencing previous results. Providers can also add comments, assign flags, or set reminders for results they want to refer to later.

In addition to training and workflow issues with in-baskets, another complicating factor is the frequent departure of medical residents from the system. The Medical Center also serves as a teaching facility, staffed by medical residents and fellows who graduate and leave on a regular

basis. Individual departments have disparate approaches to provider offboarding in general and EHR check-out processes in particular. As a result, many residents and fellows have graduated from the Medical Center with a backlog of results remaining in their in-baskets.

In November 2019, an initiative was launched throughout the Medical Center to address this issue. This project has several interrelated aspects, which can be divided into two broad categories. First, the backlog of in-basket results must be eliminated in a way that provides for patient safety. Second, processes must be implemented to prevent reaccumulation of results in in-baskets. The current backlog is being addressed through a series of steps. The initial step was to filter all “normal” results, which presumably required no action on the part of the provider. After this initial auto-complete, which removed normal results from in-baskets, 270,830 results remained that either had abnormal findings, or had unstructured findings, which Epic’s filters could not categorize as normal or abnormal. These remaining in-basket results required a licensed professional, such as a nurse, advanced practice provider (APP), or physician to review each result and the chart to verify that suitable action was taken. For example, was the patient notified of abnormal results? Was the patient treated for the condition implicated by the result? Did ongoing monitoring take place to ensure the condition remained stable or resolved? As of May 2020, the number of results in in-baskets had been reduced to 159,271. However, as of November 2020 the in-basket results backlog had increased again to 190,446 (Appendix B), clearly demonstrating the need for processes to prevent or respond to reaccumulation.

A group within the Medical Center is currently working on processes to prevent future accumulation within in-baskets. Approaches may include transactional incentives and disincentives and requirements for departments to solidify policies for provider offboarding.

Software solutions may also be employed, such as removing results from in-baskets if they have remained there for a specified length of time.

The backlog of in-basket results that have never been marked as “done” or “reviewed” can be viewed as a symptom of another problem as well. In the current healthcare environment, providers are expected to see increasing number of patients resulting in a system that overburdens the providers (Rutherford, 2017). In addition to increasing patient loads, a growing body of research shows the unintended consequences of EHRs. While increasing overall efficiency, EHRs have also transferred some duties to providers that formerly would have belonged to MAs or nurses. With the advent of electronic records and communication systems, particularly systems that include a patient portal, a range of tasks have been shifted toward providers. Providers may even take on some of the administrative triage that MAs have historically done. While patient portals may have improved patient-centered care by allowing patients to contact their providers directly, it also means that the provider is now the one who must find the time for this communication. Frequently, this time occurs after hours (Bodenheimer, 2007). Portals have also increased patients’ expectations for timely responses from their providers.

The difficulty that some providers have maintaining timely responses to in-baskets and charting might be the result of the increased caseloads. It could also be affected by the increased requirements that EHRs have created. Consequently, in-basket results may accumulate due to providers’ workloads exceeding their capacity, rather than being the result of a conscious choice by the provider.

Rationale

This project attempts to address one of the underlying causes of in-basket backlogs: the burden that an unceasing flow of information places on providers. This paper will attempt to establish a broad framework, using evidenced-based measures, to help mitigate the burden of responding to patient in-basket results. The particular focus is the role of registered nurses to assist with in-basket results.

In pre-EHR clinical workflows, in-basket results were frequently managed efficiently by nurses, MAs, or other clinical staff. This is an example of how EHR workflow and traditional, or ideal workflow, have become misaligned. The American Medical Association's (AMA) "STEPS Forward" program highlights how better team collaboration can support patient outcomes while improving clinician experience (Jerzak and Sinsky, 2018). This program argues that nurses have a central role to play. RNs bridge the gap between the highly trained specialists/APPs and auxiliary staff, such as MAs. Nurses are uniquely qualified to use their critical thinking and assessment skills to help triage and respond to the deluge of in-basket results that flow into a specialty practice. Although the role of in-basket triage is frequently delegated to MAs, and they do have an important part to play, this project is concentrated on the special function that nurses can serve in the process. Their broader scope of practice allows them to assess more nuanced or qualitative in-basket results and may allow them to build the trust of providers reluctant to delegate the assessment of any results (Lieu et al., 2019).

The framework below will provide broad recommendations and steps to implementing a nurse-driven, in-basket triage workflow that could improve quality, safety, patient experience, and outcomes. The process was designed to be very general to reflect and serve the diverse range of specialties and microsystems that comprise the Medical Center. The hope is that this process

can be applicable to all of the Medical Center's ambulatory clinics, regardless of their specific structure or needs. The focus is on steps that can be enacted without additional programming or EHR customization to reduce the time and cost barriers that these software changes would create. Doubtless, there is value in making improvements to the software, however, these changes are outside the scope of this project. All steps should be possible within existing Epic functionality at the Medical Center.

Literature Review

A lengthy literature search and review was undertaken, which involved the extensive assistance of a senior reference librarian (the University of San Francisco Library's Liaison for the School of Nursing and Health Professions). Despite the widespread use of EHRs since 2010, very few peer-reviewed studies have been published to recommend improvements to EHR workflows in general and in-basket results in particular. A greater number of scholarly articles have studied the problems created by EHRs, but few make concrete recommendations for improvement. The majority are descriptive and attempt to quantify the problems rather than testing interventions for improving EHRs. This is particularly surprising given that nearly half of providers' office days are dedicated to EHR work (Sinsky et al., 2016). There is a growing body of research demonstrating problems and inefficiencies with EHR workflows, but a dearth of recommendations or proven interventions to ameliorate these issues. The literature has paid particular attention to provider burnout and the role that EHR workloads may be playing in that problem. Despite the limited amount of prescriptive literature, there is adequate evidence to support the use of nurses in the assessment of in-basket. There is also good evidence to support the use of care teams working on in-basket results.

This project attempts to synthesize the best recommendations available for leveraging nurses to address in-basket backlogs at the Medical Center. It relies heavily on case studies of individual group practices and other QI programs, including AMA's STEPS Forward program (Jerzak and Sinsky, 2018), AHRQ's Primary Care Practice Facilitator Curriculum (2015), and the California Healthcare Foundation's Building Teams in Primary Care (Bodenheimer, 2007). While most of these resources are directed toward primary care practices, many are equally applicable to specialty practices and have been adapted here as necessary.

Clearly, additional investigation is needed to develop evidence-based improvements to EHR workflows and the handling of in-basket results in particular. Given the near-universal use of EHRs in the American healthcare system, it is surprising that so few specific recommendations have been proposed and tested for improving EHR integration into clinical workflows. Delegation of in-basket triage would be a key area for testing and implementation. While testing this framework at individual clinics is beyond the scope of this project, it is hoped that these steps can be implemented and refined. The project team encourages CNLs at the Medical Center to implement QI projects on EHR workflow and to publish the results to add to our collective understanding of how we can address some of the negative aspects of EHR use in healthcare.

Cost Analysis

Due to a number of barriers, a specific financial analysis of this project is unfeasible. This framework is applicable to any multi-disciplinary ambulatory clinic and specialty. Given the wide variety of operational patterns and the unlimited range of procedures that could fit into this framework, any cost projections would be arbitrary. However, costs and financial benefits can and should be considered by any specific clinic that wishes to implement this process.

The key cost associated with this in-basket framework is the portion of FTE for the RN(s) working on the project. Again, this can vary widely, depending on the number of in-basket tasks selected and difficulty of the task. The more difficult a category of in-basket results is to assess, the longer it is likely to take and the more expensive it becomes. Although, if the task was formerly done by a provider and also took him/her a substantial amount of time, the savings could be much greater than the cost. If being freed from this task allows the provider to increase his/her productivity, that should be factored in.

Another difficult-to-quantify savings would be the cost of potential malpractice suits. While the incidence of malpractice suits due to overlooked in-basket results may be low, the cost per suit is extremely high. The average award for a medical malpractice suit in 2008 was \$342,670 (Carroll, Parikh, and Buddenbaum, 2012). It is not feasible, however, to predict the number of errors, or resulting law suits, that might be avoided by implementing this process.

Project Overview

The following methodology for improving EHR workflows is similar to one outlined by the Primary Care Practice Facilitation Curriculum (2015). Additional steps have been added for clarity and to account for a team approach to the project. The process was further refined for this project to incorporate other EBP practices and recommendations and to make it more appropriate to the specialty clinics of the Medical Center (Appendix C).

1. Select the project team. Depending on the size of the microsystem, a larger team may be warranted, but at a minimum, it should consist of: a provider who is motivated to make improvements to the flow of results into his/her in-basket; a nurse who is invested in improving the microsystems workflow (a CNL within the microsystem is ideally suited to this role). The team should also include an “EHR hero,” who has a high degree of competence and confidence

with the EHR and its current clinic workflow. In a small microsystem, this team member might serve a dual role with one of the positions listed above.

2. Evaluate existing in-basket workflow. The first step for any project team should be an assessment of the current situation. A common issue that has hampered the efficiency of EHRs is a lack of alignment between the clinical workflow and the EHR workflow. Mapping both the current workflow for EHR in-baskets and the clinical workflow of the same items can make disconnections clear and visible.

These disconnections can take several forms. If the current EHR workflow is inefficient or ineffective, work-arounds may arise. This can lead to several related issues, for example, duplication of tasks in the EHR and the “real world.” One of the goals for EHRs is to improve efficiency; if EHRs instead cause a duplication of effort, this should be among the first areas addressed by a revision of clinical processes. Work-arounds may also circumvent important safety protocols.

The project team next maps the desired workflow that will become part of Plan, Do, Study, Act (PDSA) cycles testing the new process (Appendix A). This step is highly specific to the individual microsystem, therefore it would be appropriate to base this ideal workflow on the project team’s familiarity with their unique microsystem. Important factors to consider when mapping the ideal workflow are frustrations that providers feel regarding in-basket results. What are the specific result types that providers believe are most inefficient and add to their EHR burden? Are there results for tests ordered by other consulting providers? Is there a particular intersection of a chronic condition and a lab result that is abnormal, but within baselines for patients with this condition? This information can be gathered through informal discussions or a more formal survey process.

If clinic staff have previously expressed concerns regarding in-baskets and triage delegation, those should also be taken into account, both as useful insights and potential obstacles to be overcome. Tuckman and Jensen (1977) warned of a stage of group development they called “storming.” Many of these pitfalls can be reduced or avoided with good planning. If providers are resistant to delegate because they lack confidence in the assessment skills of staffers reviewing in-basket results, how can this issue be addressed? Is it a lack of proper training for the staff? Is a staffer with a broader scope of practice needed? Do the staffers need to limit their review to a narrower set of in-basket results that fit within their scope and the comfort level of the provider? This last example is discussed in greater detail below.

3. Identify types of in-basket results that need change. A frequent complaint of overburdened providers is a large number of unnecessary messages in their in-baskets. The project team should discuss and, if appropriate, survey staff about any results that could be filtered out by the EMR software. This would only be for in-basket results that do not require review by the provider.

Depending on your clinical team’s workflow, some types of messages may need to be rerouted directly to more appropriate team members. The twin goals should be to allow team members to practice at the top of their scope and to reduce burden on scarce providers.

Next, consider delegation. Which tasks, directed toward providers, could be handled more efficiently by other clinical team members. Some tasks that do not require clinical judgement could be routinely assigned to MAs. Key examples are normal, routine lab results or tests ordered by consulting providers. Other tasks will require more critical thinking and judgement and should be the tasks that are delegated to nursing staff. Reports, including

radiology and pathology, typically do not provide clear-cut normal and abnormal results and should be reviewed by staff with an appropriate scope of practice.

Staffing the in-basket role with an RN is one way to respond to the concern many providers have had with MA or patient service representatives (PSRs) triaging in-basket results. With their more expansive scope of practice and clinical judgement RNs are in a unique position to fill this need in ambulatory clinics. Lieu et al. (2019). discussed at length the reluctance that many providers have to delegating review of their in-baskets. However, this paper only discussed the role of MAs in reviewing in-baskets. Filling this position with a staffer who has a broader scope could address the issues raised in Lieu et al.'s qualitative analysis.

4. Identify subsets that are easiest to address, remove, reroute, or delegate. The project team should consider very specific subsets of in-basket results where predefined diagnostics and patient populations intersect. For example, in a nephrology clinic, creatinine or BUN levels may be expected to be outside of the range considered normal for a patient with healthy kidney function. This is an area that requires a degree of critical thinking RNs provide, but it does not necessarily require the attention of the clinical team's nephrologist. Particularly in the early PDSA cycles, it may be appropriate to limit the intervention to a subset as small as kidney function labs for stable kidney transplant patients. By testing the process first with a very narrow subset, the process can be refined and a comfort and trust level will be developed with both the provider and the nurse to whom the in-basket results are delegated. The next cycle might include ultrasounds of this patient cohort.

Before proceeding with the early, small-scale tests, the project team should consider which subsets would yield the greatest impact with the least effort. Tools such as Lean Six Sigma's PICK chart can help by mapping potential tasks' impact on the Y axis and difficulty on

the X axis (AHRQ, 2017). High impact tasks would include in-basket results that are high volume or require more provider time to read and interpret. Low impact tasks would be those that are rare, and/or can be quickly dispatched by the provider. Effort is a measure of difficulty in implementation. This could include training and expertise needed to categorize the in-basket results or it could be a matter of existing software functionality. If Epic is currently not configured to filter and route the in-basket results, that higher level of effort should be taken into consideration.

5. Choose clinical teams and tasks. Based on the criteria above, the team should select the tasks for the preliminary PDSA cycle and clearly define those tasks and the players. It is essential for clinical team members to understand their role, what is expected of them, and how to proceed in different circumstances. Which in-basket results can be marked as “done” and which warrant the provider’s attention? The project team should also decide on how best to combine Epic and face-to-face communication. If the result arrived first in a pool in-basket, it will need to be forwarded to the provider. If the RN reviewing the result is attached the providers basket, it may need to be flagged or highlighted in the EHR. A third approach is a technique endorsed by Jerzak and Sinsky (2017). In-basket results that are abnormal or otherwise require the provider’s attention may be summarized and presented in a brief SBAR huddle. Jerzak and Sinsky estimate that this can save up to one hour per day of provider time.

Regardless of the EHR flow, two additional considerations should be addressed. First, what training needs exist? One benefit of attaching RNs to provider’s in-baskets is the higher-level scope of services, compared with MAs. However, training and discussion between team members is still necessarily to clearly outline what in-basket results should be filed, versus forwarded to the provider. At least an informal level of additional training should be

incorporated. Second, the project team should evaluate the current level of co-location for team members and consider making changes. While this may seem unnecessary for electronic workflows, collocating team members can make brief clarifications and discussions easier, resulting in both more efficient workflow and more thorough patient care.

6. Do. As your clinical team begins using the new in-basket workflow, it is important to affirm that players roles are clear to them and those they are working with. If expectations are not explicit, in-basket results may be marked as done when the provider does in fact need to see them. Conversely, if results are being passed to the provider, when they could have been marked as done by the staffer, it would simply result in duplication of efforts. Either scenario would undermine trust between the team members.

Mitchell, et al. (2012) also noted that clinical team members must be supported in their roles and tasks. As knowledge gaps arise, they must be addressed as part of an overall environment of continuous learning. In addition to roles being clear, it's equally important that team members are supported with the time that will be required to launch and maintain new responsibilities. If staff have not been prepared for their new roles, were not adequately trained, or do not feel supported in new roles, frustration and new burnout may result. The willingness to ask questions and request support should be viewed a strength. Being proactive with these concerns contributes to the over-arching principles of efficiency and patient-centered care.

Close attention must also be paid to the effect the new in-basket workflow has on other areas as well. If time is being reallocated to a new process, other areas may be neglected or could become overburdened. Stay mindful of these ripple effects and respond as necessary throughout the PDSA cycles. Failure to respond rapidly to these symptoms can lead to long-term damage to the work environment and trust between team members.

As noted above, a change of in-basket roles does not require a full-scale roll out. Starting with a small set of very narrowly defined tasks will not only allow testing of the process, but will help build the trust needed to go forward. Some providers may initially be hesitant to let another discipline assess and handle reports and lab results. Generating short-term wins will help build the mutual trust needed for shared responsibilities to work. By starting with small and well defined subsets of tasks (such as the nephrology clinic example described above) trust can develop in increments and be built upon, until the process has expanded to function optimally within the clinic.

7. Study. The PDSA is a flexible process that allows for adjustments throughout the trials (Institute for Healthcare Improvement (IHI), 2005). Changes can be made at any point the need is determined. There is no prescribed time period or measure to reach before changes can be made or evaluation done. The project team can decide when to study their progress.

In the early stages, the most likely outcome is that the process will need to be tweaked. Perhaps one task or subset of tasks is better suited to real-time discussions than merely flagging the result. A task's position on the PICK chart should also be re-examined. If a task subset has yielded fewer gains or has proven harder to maintain than expected, it may be removed from the process. An example might be radiology reports or only a specific type of radiology report. The subset could be as small as reports from a specific radiologist who uses an idiosyncratic style or template. If a particular task subset always or nearly always requires additional discussion between the nurse and the provider, the team should re-evaluate whether or not it is an appropriate area for delegation. If not, these reports might routinely be forwarded to the provider or left in the in-basket for him/her to interpret.

The most basic measure of the project's success is the volume of the in-basket results backlog for individual providers and/or the microsystem. Has the backlog decreased since implementation? Epic reports can easily demonstrate this. More detailed quantitative results may require the assistance of an informaticist. Qualitative measures may include surveys of patient and staff satisfaction or surveys of burnout symptoms. These measures would be useful over the long-term and do not fit into the early PDSA process.

8. Expand. If the delegation of a task or task subset is working effectively, that task can be expanded, or new subsets added. Team communication is essential and is part of fostering the overall learning environment Mitchell, et al. (2012) described. As the process continues, patterns emerge for which in-basket results warrant additional review by the provider and which can be handled by a reviewing nurse. This natural progression should guide the expansion of the in-basket process through additional PDSA cycles. The eventual goal of the PDSA is to enter into standardize, do, study, act cycles (IHI, 2005). Once the process has matured, it can be implemented with additional providers and more clinical teams within the microsystem.

The styles of individuals and specific populations must be considered and the process adapted as new teams take on the process. While the new teams will certainly benefit from the experience of the first teams to develop and implement this process, it should not be considered a one-size-fits-all solution. A clinical team practicing the same specialty may nonetheless require a different workflow. Another provider may be comfortable with a narrower or a broader set of tasks being handled by the team that is attached to his/her in-basket.

Methodology

Data Source

The primary data for this project was derived from reviews of more than 3,000 charts that remained in providers' in-baskets after those providers had left the Medical Center. The in-basket results reviewed included abnormal lab results, pathology reports, radiology reports, procedures notes, and interoffice communications. As part of the chart reviews, additional progress notes and documentation of patient communication were also examined. Results that preceded and followed the one in the basket were also examined to determine a) if the abnormal findings were the result of a condition that was already known and under treatment, or b) was new, but received appropriate monitoring and/or treatment. Based on these chart reviews, patterns of in-basket results were observed and became a qualitative basis for the recommendations in this project (workflow issues are mapped in Appendix D). Additional qualitative information was obtained through interviews with staff involved in the backlog project and a management team at another large healthcare system in the Cleveland area.

Expected Results

Demand for healthcare is growing as the population ages and faces the intertwined epidemics of obesity and diabetes (Ghorob and Bodenheimer, 2012) and faces a general shift toward chronic illness. The average provider's patient load is already too large and is expected to continue to grow. This problem confronts both primary care and specialty practices, with referrals to specialists rising rapidly (Mitchell et al., 2012). Meanwhile, changes in reimbursement are exerting pressure on providers to see more patients as well (Rutherford, 2017). None of this bodes well for patient safety or the quality of patient-centered care.

Increased patient load (or “panel size”) not only impacts patients, but the providers themselves. 54% of physicians report one or more signs of burnout (Sinsky et al., 2016), a 17% increase over a three-year period. Burnout is a contributor to physicians leaving medicine (Jerzak and Sinsky, 2017), which puts a further strain on the supply of healthcare providers. The result is a cycle that fuels longer waits to see providers and decreased patient satisfaction.

EHRs, while providing many benefits, are also adding to this strain by putting additional workload and stress on already overtaxed providers. Sinsky et al. (2016), reported that on office days, providers spent 49.2% of their time on EHR and desk work, while only 27% of their time went to direct clinical work. Of the physicians who documented their after-hours time, the mean was 1.5 extra hours per day, with 59% of that time going to EHR work. There is an obvious need for improved support to reduce this EHR workload to reduce provider burnout and improve direct patient care. Highly functioning healthcare teams are one way to leverage these providers to increase the time available for direct patient care.

According to Emani et al. (2019), delayed response to test results, lack of coordination, and inadequate short-term follow-up affect roughly 12 million outpatients in the U.S. each year. The patient safety implications are clear. Poor response to test results and reports can have a major impact on outcomes. Better systems could help reduce the roughly 5.08% diagnostic error rate in the U.S. (Singh, 2014). A brief strengths, weakness, opportunities and threats (SWOT) analysis of this framework is shown in Appendix E.

Nursing Relevance

This evidence-based project addresses the quality improvement task elements (King and Gerard, 2016) and has clear benefits in all six Quality and Safety Education for Nurses (QSEN) competencies:

Teamwork and Collaboration: The central issue of this project is to promote better collaboration within clinical teams to reduce in-basket result backlogs. Increased collaboration between providers, RNs, and other clinical staff to address in-basket results could yield benefits in all areas of the triple and quadruple aims (population health, experience of care, per capita cost, and clinician experience) (IHI, n.d.; AHQR, n.d.).

Quality improvement: As noted above, delayed response to in-basket results has a direct effect on the quality of care. Time spent on EHR tasks is time that could have been spent with patients. Any improvement to the efficiency of EHR workflows has the potential to directly improve patient care.

Safety: As reported by Emani et al. (2019), delayed response to in-basket results is also a significant contributor to safety problems in ambulatory settings. Better workflows for results and RN collaboration could improve safety directly and indirectly. By preventing in-basket backlogs, we will also be able to verify that results have been reviewed, thereby improving safety through proper documentation.

Evidence-based practice: The framework proposed above is based on EBP from a variety of sources. The recommendations are specific enough to provide a blueprint for implementation, but broad enough to be applied to the Medical Center's wide range of microsystem specialties, structures, and cultures. Still, a much greater number of evidenced-based publications are needed to address the needs outlined here.

Patient-centered care: One of the problems that was identified in the chart reviews was a lack of documentation for communication of results to patients. Other records showed a series of requests by patients for their results and/or explanation of the results, without documentation

that these requests were fulfilled. A nurse is ideally suited to the role of educating patients based on their in-basket results.

O'Malley et al. (2014) also found that the kind of collaboration and team-based care described in this project are key contributors to high-quality, patient-centered care. They describe how proper delegation and well utilized nursing staff can free other, highly trained clinicians to improve care by focusing on the patients with the greatest needs.

Informatics: Informatics have played a key role in the genesis of this project, identifying and quantifying the backlog. They also have a critical role to play in implementation at the microsystem level. Informaticists should remain involved with individual clinics as they begin implementing processes to better manage in-baskets and address the issues caused by in-basket backlogs.

Summary Report

The project began as a problem in need of a long-term solution. The proposal was to work on "...medical record review and in-basket management of lab/imaging results by specialty." Under the supervision of a nurse informaticist and an LVN, the project team was asked to review individual results that were still in providers' in-baskets, to confirm that appropriate follow-up had occurred. Team members worked 16 hours per week, reviewing results one in-basket at a time, to reduce the backlog.

From there, the team worked with the Associate Chief Nursing Officer of Ambulatory Clinical Services at the Medical Center to formulate a quality improvement project, based on the team's experience with the in-basket backlog. As mentioned above, one of the contributing factors to the backlog is the ongoing turnover produced by entering and graduating fellows/residents. The team originally considered designing an "offboarding" process. This is another need of the Medical

Center, and like the final project, there is a surprising paucity of existing research on the subject, despite how common the phenomenon is. There is some research available on the “July effect” (a perceived loss in quality of care when old residents graduate and are replaced by new residents). However, there was essentially no evidence on which to base such an offboarding project.

An important confounding factor is the unprecedented global pandemic which was taking place during this project. The team was mandated to do most of their work from home and had no interaction with the individual clinical sites. This precluded some steps, which might have otherwise been included, such as microsystem assessments. Consequently, the project had to be of a general nature, adaptable to any microsystem at the Medical Center. This situation also prevented the team from testing any of their proposed changes, or measuring outcomes. It is the team’s hope that some of these recommendations may be implemented after the conclusion of the project.

While the team did not have the experience of implementing the project in a clinical setting, a great deal was learned by developing these recommendations. A wide range of EBP, QI, group dynamics, and management theories were considered and included as appropriate in this framework. Given the very limited literature currently available on the topic, it was an exciting and challenging opportunity to synthesize a cohesive plan from a wide array of sources. Rather than applying well established practices, which is a very important part of quality improvement work, this project presented the opportunity to create something de novo.

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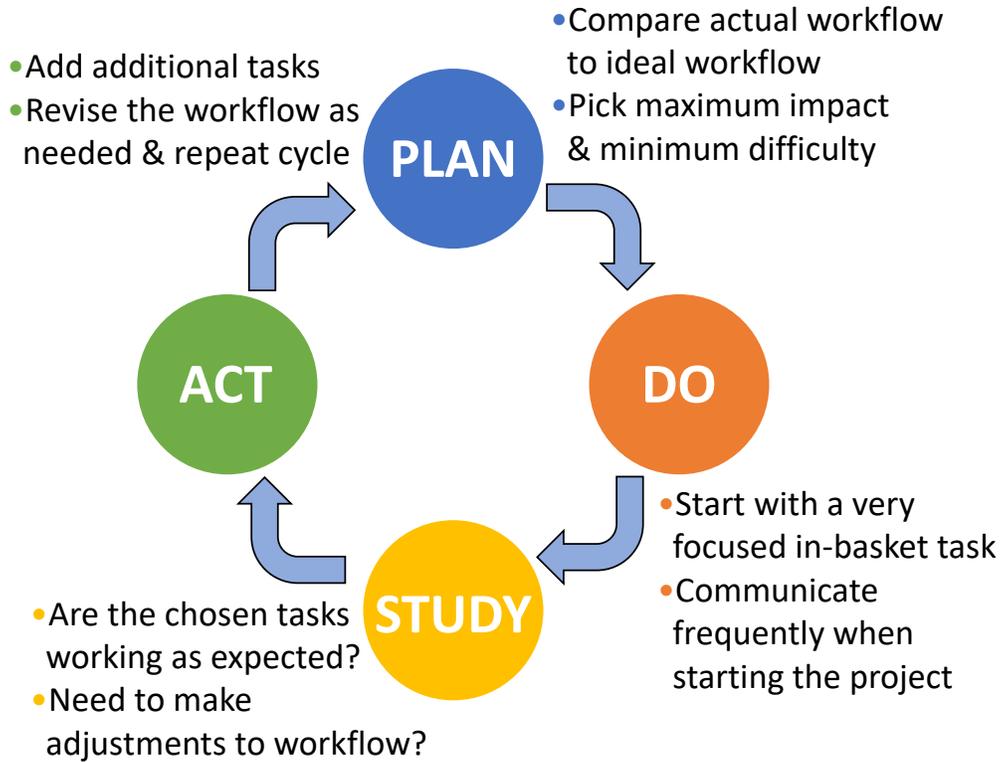
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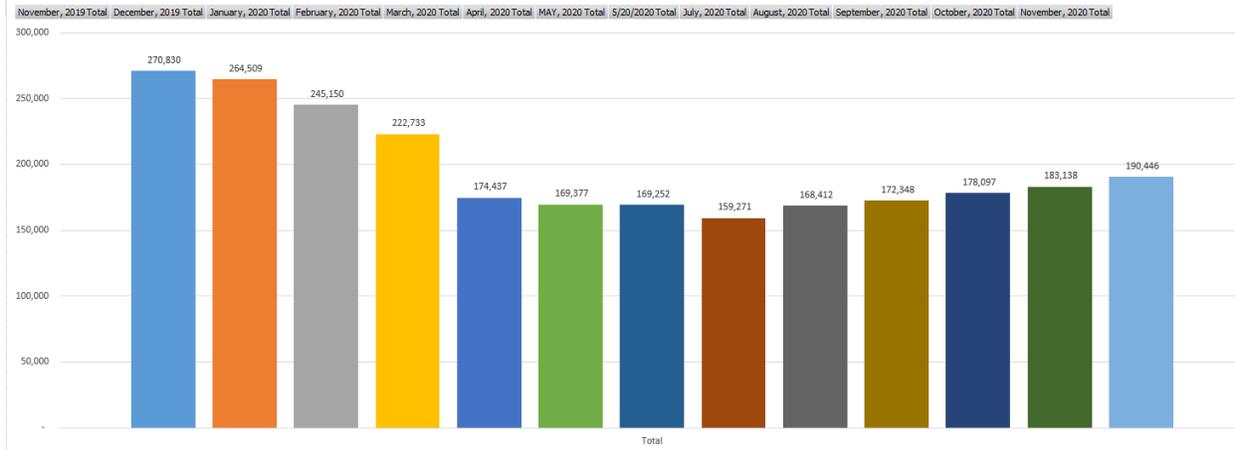
Appendix A

PDSA Cycle



Appendix B

In-Basket Results Backlog Volume



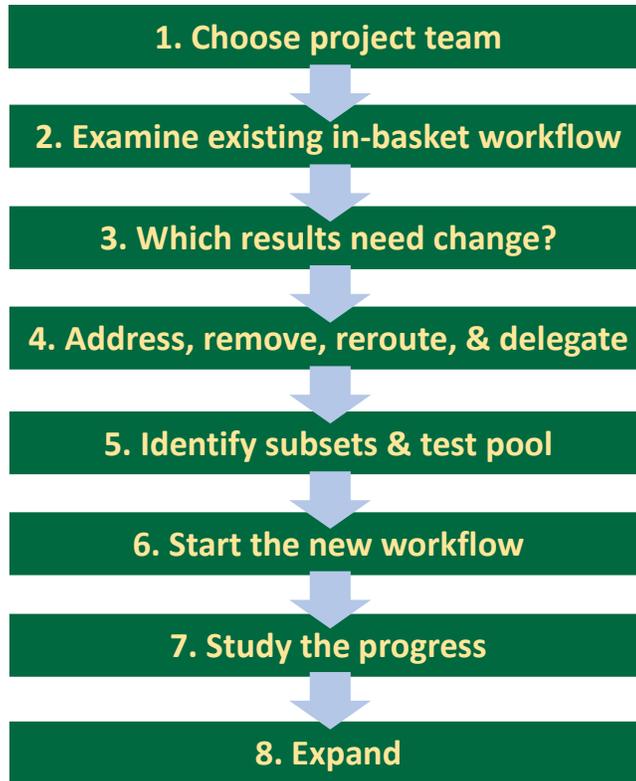
Values

- November, 2019 Total
- December, 2019 Total
- January, 2020 Total
- February, 2020 Total
- March, 2020 Total
- April, 2020 Total
- MAY, 2020 Total
- 5/20/2020 Total
- July, 2020 Total
- August, 2020 Total
- September, 2020 Total
- October, 2020 Total
- November, 2020 Total

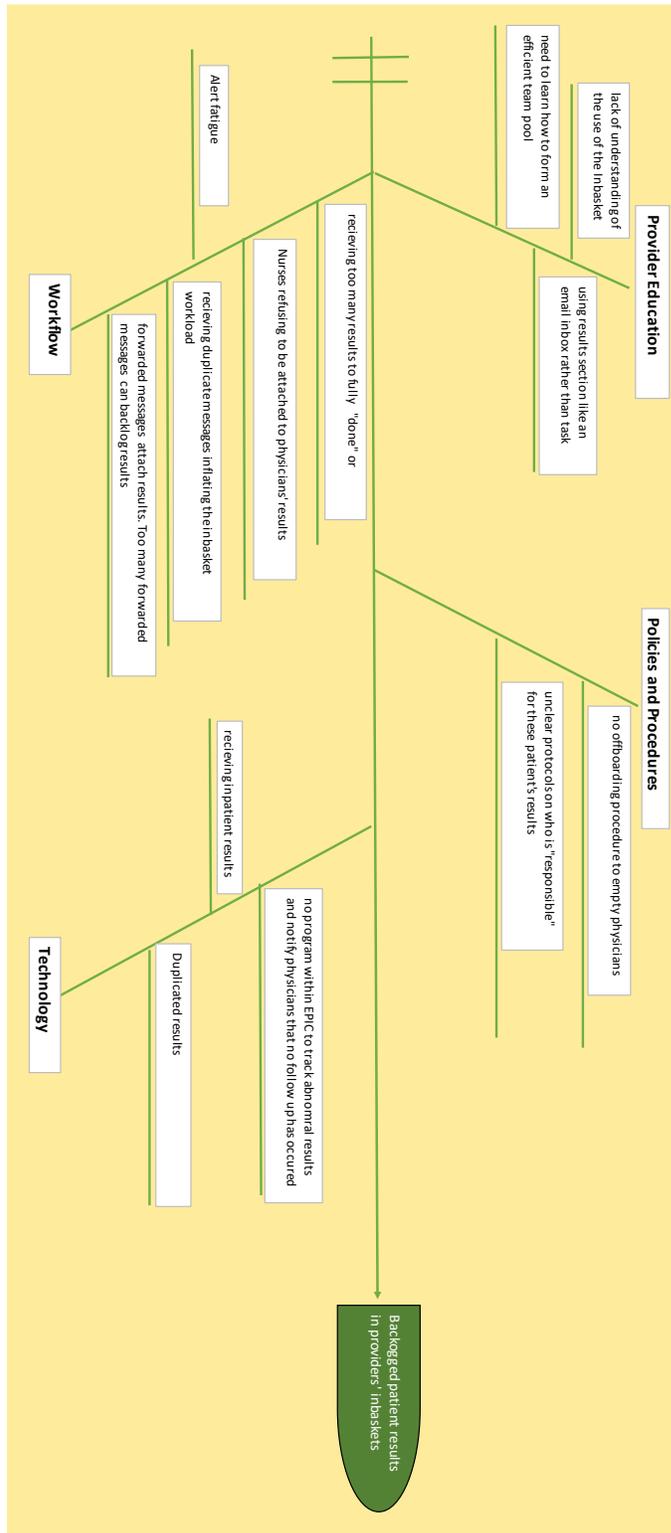
(Academic medical center, 2020.)

Appendix C

Framework Steps



Appendix D Fishbone Diagram



Appendix E

SWOT Analysis

