

INTER-VISIT CARE IN AMBULATORY CLINICS:  
A QUALITATIVE ANALYSIS

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A CAPSTONE

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CERTIFICATE OF APPROVAL

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This is to certify that the Master's Capstone Project of

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*“Inter-Visit Care in Ambulatory Clinics: A Qualitative Analysis”*

Has been approved

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AD: conducting interviews, transcription, theme analysis, manuscript. AD had full access to all the data in the study and takes responsibility for the integrity of the data and accuracy of the data analysis. JA: qualitative interview guide design and revisions. VM: study conception and design, revisions. BO: study question refinement, conception and design, participant recruitment, revisions.

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## **ABSTRACT**

**Objective:** To identify clinicians' and staffs' highest priority concerns for inter-visit care, observe the variation of needs across different specialties, and to characterize the differences in perception of inter-visit care management between clinicians and staff.

**Materials and Methods** We conducted a qualitative phenomenological study consisting of semi-structured interviews of clinicians and clinic staff recruited via purposive sampling. We obtained 11 interviews from 6 clinics in a variety of specialties, and analyzed responses for themes via a grounded theory approach.

**Results** Clinics' experiences of inter-visit care centered on four major themes: 1) inadequacy of tools, 2) sequelae of poor interoperability, 3) reactive instead of proactive workflows, and 4) need for increased staff. All clinics devoted high levels of staffing resources to inter-visit care, and additional staff consistently demonstrated partial but appreciated improvements in task management. However, these solutions depended on manual chart review, were not scalable to increases in task volume, and often required higher-credentialed team members to remain involved in menial tasks.

**Discussion** Frustration, inefficiency of resource utilization, compromises to optimal patient care, and resultant moral injury are emergent properties of ambulatory care's inability to effectively manage high task volume and interdependent actions of multiple contributors to patient care.

**Conclusion** Inter-visit care is a highly complex component of ambulatory medical practice, demanding large investment of resources. Improvements in inter-visit care were often achieved with expensive and non-scalable staffing solutions.

## INTRODUCTION

The ambulatory clinical care model requires medical decision-making from any given clinical encounter to be carried out in the interval between visits, which serves for both the opportunity to obtain additional diagnostics and/or enact medication or lifestyle changes, and then depends on follow-up of that information at the subsequent visit.<sup>1</sup> Clinical plans frequently require a complex and series of action items to occur before the next clinic encounter, when the provider will use the results of those tasks to formulate the next stage in the medical plan. These may include diagnostics, referrals, laboratory monitoring, medication changes, and other actions on the part of the provider, clinic staff, patient, and third parties. The negative impact of patient non-adherence has been recognized for decades,<sup>2</sup> and has remained an ongoing problem, with 20-50% nonadherence rates that rise to 40-86% in the elderly population.<sup>3,4</sup> However, patients may also misunderstand plans and make medication errors even when they attempt to follow a physician's instructions.<sup>5</sup> Physicians have similarly poor rates of task completion, with inadequate follow-up on test results can range from 6.8-62% for laboratory tests, and 1-35% for radiologic studies.<sup>6</sup> These rates vary widely with the degree of clinical concern, the presence of an electronic health record (EHR), and its effectiveness in alerting physicians. Successful follow-up is a multi-step process, failure of any of which may break the chain required to successfully complete an action item. These failures can occur with the processes of arranging for or performing the test, or with obtaining, interpreting, or communicating results.<sup>6</sup>

The combined effects of multiple failures in follow-through between clinic visits prevents the plan as initially formulated from being properly assessed and advanced, leading to adverse patient outcomes and inefficient utilization of healthcare resources.<sup>6,7</sup> Automation of care gap management thus far has focused on disease-based registries to identify care gaps across populations with some success,<sup>8,9</sup> but these are labor-intensive to configure and require a homogenous patient population and treatment plan to be successful. To address the complexity of patient management and follow-

up, medical practices have looked to care coordination models to manage patient needs over time. While care coordination shows positive effects on patient outcomes<sup>7,9,10</sup> and engagement,<sup>12</sup> evidence of cost-effectiveness is less clear, with some use cases demonstrating savings<sup>11,12</sup> and others studies finding cost-neutrality at best.<sup>15</sup> A major driver of the costs of care coordination is the reliance on manual chart review and organization of tasks, requiring significant—and often not reimbursable—staffing resources.<sup>16,17</sup> Ambulatory care physicians must also invest many hours on task management in addition to their scheduled clinical time, which is a major contributor to physician burnout and associated costs to the healthcare system.<sup>18</sup>

While prior work has identified specific components of barriers to effective completion of clinical plans, such as patient adherence, provider lab test follow-ups, and the role of documentation styles in improving recall and follow-up, the combined effect of these factors on the functioning of clinics as a whole has remained under-studied. Any given patient may have barriers to reliable and timely care that span many of these domains and these factors combine at the clinician or practice level depending on the particulars of their workflow and the types of actions that must occur between visits. Therefore, approaches that focus solely on patient adherence, lab follow-up or other discrete components of inter-visit care are not able to capture the magnitude of the issue and the combinatorial effects of each of these domains. Clinics are currently devoting significant staff and provider time on a variety of care coordination processes and mitigation strategies for missed tasks, which are catching “near miss” events or averting patient harm from delayed tasks. Therefore, blunt measures such as percentages of incomplete tasks or patient outcomes cannot capture the extraordinary investment of time and resources that providers and staff must devote to these issues, even to maintain a still-incomplete current state of comprehensive care. In addition, such measures do not explore the negative impact on clinicians and staff from overload and burnout that arise from such burdensome workflows. This study aims to explore how providers and their staff are currently managing inter-visit care, what barriers exist to following through on plans, negative outcomes of

inadequate inter-visit care to both patients and providers, and their highest priority needs to improve the current state.

## **MATERIALS AND METHODS**

### **Objective**

To identify clinicians' and staffs' highest priority concerns for inter-visit care, observe the variation of needs across different specialties, and to characterize the differences in perception of inter-visit care management between clinicians and staff.

### **Study Design**

Qualitative phenomenological study consisting of semi-structured interviews of clinicians and clinic staff recruited via purposive sampling.

### **Setting**

This study assessed inter-visit care in ambulatory clinics in our home institution, an academic medical center with pediatric and adult ambulatory clinics providing nearly 1 million ambulatory visits annually (as of 2019).

### **Selection of Subjects**

Subjects were selected by specialty, and then within each specialty a physician and a member of the ancillary staff were interviewed. Inclusion criteria for participation at the specialty level were that a candidate must 1) have ambulatory clinics, 2) maintain a longitudinal relationship with its patients over time, and 3) depend on ongoing management in terms of medications, testing, and follow-up. Strictly procedural or consult specialties were excluded. Specialties were specifically selected to vary in terms of the time course of their disease processes and therefore the types of diagnostics, management recommendations, and inter-visit tasks to obtain as wide a view of the

problem as possible. Inclusion criteria for physicians were 1) current practice in the ambulatory setting, and 2) a faculty-level appointment. Inclusion criteria for staff were 1) current employment in an ambulatory clinic, 2) direct patient communication, and 3) management of inter-visit care. Individuals who provided only day-of clinical support were excluded.

Our team brainstormed a selection of specialties that would encompass the range of factors above, and expected to reach thematic saturation within six clinics. We settled on Adult Addiction Medicine (a subspecialty of Primary Care), Adult HIV (a subspecialty of Infectious Disease), Adult Oncology, Genetics, Pediatric Endocrinology, and Pediatric Neurology. All clinics approached agreed to participate, and sent invitations and/or recommendations for the clinician and staff members to interview. When multiple volunteers or recommendations were available, the first respondent available was interviewed. Each clinic provided one physician and one staff member; only one individual recommended by their peers declined to be interviewed. Some providers had additional subspecialty training within the specialties selected by our brainstorming process. The provider and staff dyads within each specialty were not required to work directly together or to share the same sub-specialty.

### **Interview Guide**

Based on the issues expressed in various Quality Improvement initiatives that inspired this research, we developed a semi-structured interview guide to address known facets of inter-visit care and open-ended questions to elicit new issues. Interview guides were developed in parallel for clinicians and staff to reflect different perspectives on the same aspects of inter-visit care (Table 1).

Interviews were conducted remotely and were recorded via the video-conferencing software used. Each interview lasted between 15 minutes and one hour. During the interview, additional follow-up questions were allowed for clarification and exploration of issues in further detail.

Table 1: Interview Guide Questions

Clinician	Staff
<p><b>1. About You</b></p> <ul style="list-style-type: none"> <li>a. First, we'd like to learn a little about you. Could you give us a few words about your background?</li> <li>b. What are the common conditions that you see in clinic?</li> </ul>	<p><b>1. About You</b></p> <ul style="list-style-type: none"> <li>a. First, we'd like to learn a little about you. Could you give us a few words about your background?</li> <li>b. What type of work do you do in your clinic?</li> </ul>
<p><b>2. Inter-Visit Care</b></p> <ul style="list-style-type: none"> <li>c. After a clinic visit, what are some common tasks that should be fulfilled before the next clinic visit?</li> <li>d. How are these elements supposed to be monitored and followed up?</li> <li>e. Does your clinic use any software or system to keep track of these tasks?</li> <li>f. In practice, how are these actually monitored and followed up?</li> <li>g. What are the most common parts of your plans that remain uncompleted in follow-up?</li> <li>h. What are some tasks in your plans that would be dangerous if they were left unaddressed?</li> <li>i. Do you usually find out about incomplete tasks in the interval between visits, during the next clinic visit, or both?</li> <li>j. Can you tell me about an example of a time when a plan fell through and any difficulties that arose?</li> <li>k. Do you have difficulties with new patients showing up without expected results or documentation?</li> </ul>	<p><b>2. Inter-Visit Care</b></p> <ul style="list-style-type: none"> <li>c. What is your clinic's typical pattern for handling to-dos between visits?</li> <li>d. Does your clinic use any software or system to keep track of these tasks?</li> <li>e. What are common issues that patients call about between clinic visits?</li> <li>f. What are common issues for which you need to reach out to patients between clinic visits?</li> <li>g. Are there times when handling to-dos between clinic visits is inefficient? How so?</li> <li>h. What aspects of following up on to-dos between clinic visits are frustrating?</li> <li>i. How often do you find patients seem to be unclear on the plan between clinic visits? In what way?</li> <li>j. Can you recall a situation where there was a conflict between patients, clinic staff and/or providers due to a problem with a follow-up plan?</li> <li>k. How does your clinic make sure that a patient is ready for their first visit with a provider?</li> </ul>
<p><b>3. Onward &amp; Upward</b></p> <ul style="list-style-type: none"> <li>l. What would you most like to see fixed about care that should happen between visits?</li> <li>m. In a perfect world, how do you think inter-visit care should happen?</li> </ul>	<p><b>3. Onward &amp; Upward</b></p> <ul style="list-style-type: none"> <li>l. What would you most like to see fixed about care that should happen between visits?</li> <li>m. In a perfect world, how do you think inter-visit care should happen?</li> </ul>

**Data Analysis**

Interviews were transcribed manually for optimal accuracy and analyzed by a single investigator (AD). During the acquisition and transcription process candidate themes were identified, and

interview transcripts were analyzed with the aid of Taguette open-source qualitative research software.<sup>19</sup> Themes and subthemes were refined and grouped iteratively according to the grounded theory approach.<sup>20</sup>

## RESULTS

We conducted eleven interviews, with six clinicians and five ancillary staff members. A sixth staff member declined to be interviewed and an alternate was not available during the interview timeframe, and responses to date indicated that saturation of content had been reached.

Interview responses consolidated around four major themes: 1) inadequacy of tools, 2) sequelae of poor interoperability, 3) reactive instead of proactive workflows, and 4) need for increased staff, each of which contained multiple sub-themes (Table 2).

Table 2: Themes and subthemes

Theme	Sub-themes
Inadequacy of Tools	Burdensome manual chart review Limitations of EHR functionality Need for ancillary aids
Sequelae of Poor Interoperability	Problems finding external resources Tasks beyond clinic's control No mechanism to notice a missing result
Reactive Workflows	Idiosyncratic follow-ups Lack of clear protocols Downstream inefficiencies Increased stress Moral Injury
Need for Increased Staff	Partial improvement with additional staff Need for close-knit teams Upward shift of task management Devoted staff for preparing new patients Brittle workflows vulnerable to disruption/change Dependence on patient self-management

### Theme 1: Inadequacy of Tools

Providers and staff described major deficiencies in health IT tools to track inter-visit care. The major manifestation of this shortcoming was clinics' dependence on manual chart review, in which

clinicians or staff (usually both) manually investigated a patient's chart prior to a visit. Providers and staff alike reported spending many hours per week on finding incomplete tasks and organizing them without including the time to make progress on the task itself. Not only was manual chart review a significant burden on clinics, it could not be done too early, or orders and authorizations might expire, but performing these tasks too late meant identified tasks could not be corrected before a clinic visit:

*“Usually I try to review charts at least a week before a patient's coming in, to see what's scheduled and what's been done. [...] And, the nurse coordinators do that as well. [...] The problem is that if you start doing that fairly close to the visit, it can be difficult to schedule things like scans and that sort of thing.”* –Physician

The variability in the timing required for tasks prevented instituting a predictable anticipatory workflow:

*“The time process of different labs takes a while that we kind of have to figure out. Kind of, when the should be coming back, and if the parents can ever let us know if they just had them drawn so we can have them on our radar.”* –Medical Assistant

While physicians were generally aware of relevant tools in the EHR for task management, they frequently reported them being difficult to use or set up.

*“The reminders I could not make work in a way that was efficient for me, so I just let them go.”* –Physician

While providers and staff preferred to work within the EHR whenever possible, encumbrances necessitated maintaining ancillary documentation, usually in the form of a spreadsheet. While spreadsheets had apparent drawbacks of duplicating work, risks of mistyped dates and other errors, and difficulty integrating into an EHR-focused workflow, the frequent benefits cited were that they

allowed for structured task management for a particular patient population and comprehensive evaluation across patient panels:

*“[Patients] have to move through a specific process. So, it’s almost like a phase of testing, and in order to track the phase, where they are, so they have to get [a series of tests] and then after that we determine, do we move forward or do we not move forward? [...] It’s not something that’s easily tracked in [the EHR]. You can’t really follow a true trajectory of a plan [...] so in order for me to follow a stepwise fashion, I have to create a flow for the patient specifically. So it’s almost as though I have a working algorithm for them. And it’s individualized, so I kind of tailor it to each patient, and then I [...] just use my own personalized templates of meeting their needs.” --Nurse*

*“That has happened to me where I postponed something and then I realize I really needed to see what it was, or, you know, and basically once you’ve postponed, at least I don’t know a way to go and see what’s been postponed, looking at what stuff that [the EHR] has. I’ve never found that function in there.” --Nurse*

Different staff members had different thresholds for when shortcomings of the EHR merited maintaining an ancillary tool, and even within clinics this could cause frustration between teammates:

*“The person, I think that maybe, I don’t know if somebody at one point preferred to have a bigger picture in terms of how many patients we’re working with? Rather than if you’re using the postpone function in [the EHR], obviously, you don’t have a way of compiling all of that into one place to look, but no, I would much prefer just to keep everything in [the EHR]. I find the spreadsheet kind of clunky.” --Nurse*

## **Theme 2: Sequelae of Poor Interoperability**

Clinics consistently described difficulties in finding information from external sources. Even when compatible EHRs were nominally interoperable, differences in alerting behavior or data storage structure placed considerable burden on staff to find out-of-institution information:

*“Sometimes we have a hard time tracking down lab work. We have a lot of specialty labs, where they’re not always done at a normal lab--we have to send them out to esoteric requests, and it’s a lot of run-around and kind of a scavenger hunt to figure out when they got them done and where.”* –Medical Assistant

*“Whether they got faxed, and got sent out into never-never land or whatnot, we didn’t have a telephone call to follow up to make sure it was done, or some other mechanism, and so it never got to us, I presumed it had not been done [...] I think this was as I was preparing for clinic, our nurse called [the family], they said ‘Yes we did it, months ago,’ and then it came in.”* –Physician

Barriers to information flow became especially difficult when tasks had numerous steps that were beyond the direct control of the clinic. If the task completion chain was broken outside the ordering clinic, clinicians and staff reported a higher likelihood that they would receive no notification, whereas the same procedure would generate an affirmative notification if the loop were successfully closed.

*“You know, if I order an imaging study, if I don’t get a report, first of all, I don’t even know when it’s scheduled, usually. [...] And of course, an imaging place, may be getting hundreds of orders a day [...] and those orders are going through the lowest-level people, meaning scheduling people and authorization people, not clinicians, so it isn’t necessarily associated with an awareness or the idea that I need to notify the ordering physician, particularly if they’re not part of our system, that this order is now in place, and when it’s*

*going to happen. That may be the biggest, the single most frustrating thing, is not even knowing if something's been done, especially if it's being done elsewhere [...] so it's not within our immediate feedback. And that's not unique to here. That's a problem everywhere.” –Physician*

*“The problem is if don't get reports, especially if it's a three-month visit or something, before the appointment, I may well not remember that the patient has an appointment coming up. Our nurse coordinators try to help with that as well, but there's a difficult-to-fill hole there. You know, it's hard to sort of, ensure, that the primary clinician gets feedback.” --Physician*

### **Theme 3: Reactive Workflows**

Five out of the six clinics interviewed reported significant stressors related to inter-visit care. The sixth clinic was able to proactively leverage EHR reminders and tasks so that reminders were timely and inbox clutter was intentionally pre-empted with aggressive forward-dating and protocols to complete tasks. However, this clinic required immense resources required to sustain this level of management: the physician reported spending at least an hour per half-day of clinic solely on inbox management, manually setting reminders, and forward-dating tasks (they also noted that due to increased patient concern due to the 2019-20 novel coronavirus pandemic, their task management time increased to two hours per half-day of clinic). They described their strategy of sending discrete, focused tasks to particular team members, noting

*“And it also declutters that way. If you can complete a task, and it's an up-to-date moving target, then people get a sense of completion, and a sense of accomplishment that happens with this being done.” –Physician*

Although staff in this clinic did not need to devote time to coordinating task management or screening for incomplete tasks (both major components of care coordination elsewhere), they still reported 75-80% of their time was spent on inter-visit care in completing tasks assigned for them, and the main frustration was monitoring tasks that were out of the clinic's direct control, such as unreturned patient messages. While the subjective experience of a reactive and out-of-control workflow was absent from this clinic's interviews, the strategy of focused, discrete tasks was sometimes perceived by staff as "micromanaging."

The remaining five clinics reported the volume of tasks, the insufficiencies of their EHR, and interrupted information flow all overloaded their capacities to identify and complete all tasks proactively. Clinicians frequently reported prioritizing task completion based on their level of concern for a particular patient, and this decision-making was generally implicit and intuitive:

*"Those kids that I'm really worried about, I'm actively following in a different way, and you know, presumably you should follow everybody the same, because if you're ordering a test it might be abnormal, [...] so we need some form of follow-up for all of the tests that I've ordered, it's just that staffing has never been realistic and that doesn't make it ok."* –

Physician

Staff similarly felt that the lack of standardization impeded their ability to be efficient, worsened by the chronic overload of tasks:

*"All of our providers tend to have a different perspective on whether we should do standardized labs, so [it's] very provider-specific, [so] there's a lot of grey area for our patients and for our team to actually know how to guide them through."* –Nurse

*"Standardizing our own care, for example we do a lot of education with schools, so I think that we can develop more school protocols, most of the time we are reactive instead of proactive with our care."* –Nurse

*“That would be more ideal if we could be proactively following patients in terms of getting everything done in between visits, but, the practice is just too big, so we’re kind of in a reactionary mode.” –Nurse*

Without tools to effectively track inter-visit care with adequate situational awareness across a panel, and compounded by the saturation of ancillary staff’s time with manually reviewing charts for incomplete tasks, gaps in inter-visit care persisted. Material that “slipped through the cracks” often manifested not by a timely EHR notification, but by a patient contacting the clinic with a problem or a belated realization that the provider had inadequate information available to make a clinical decision. Reacting to these problems amplified inefficiencies and caused downstream problems with clinic workflow:

*“I guess when it kind of goes down the line, it ends up affecting everyone. Like, a patient is in office, and a provider is like, ‘Hey, I never got these lab results,’ or this image, and then we’re scrambling trying to not only room patients, but also to get these results, because they’re just sitting in the room waiting for things to go over. [...] It’s just very messy.” – Medical Assistant*

*“I do think it impacts care, all of these ones that don’t get followed up on, and then I see them when they come back in six months. [...] And the same thing with follow up, basically because [...] if it doesn’t get scheduled ahead of time when the family really needs to get seen, now it’s three months out before they can get seen again, unless we do an out-of-book, which is what we end up having to do. So, it impacts both on their care, and then also just on my scheduling, and the flow of the [clinic space] and whatever else as I’m begging for a room, you know, for a patient that should have been scheduled anyway—we knew this was the time they needed to be seen, rather than waiting until they get to crisis [...] we should have them in the whole time.” --Physician*

The inability to address patient management proactively was a major contributor to stress amongst providers and staff alike, with frequent use of phrases like “scrambling,” “chicken with its head cut off,” “scavenger hunt,” and “whack-a-mole.” Our interviewees also shared feelings indicating moral injury related to the difficulties in providing care at the standard to which they wished to hold themselves:

*“It definitely takes its toll. Some days are better than others with trying to put out the fires. And I know that we all have very important roles and jobs, and we are a team as a whole. But, I know, we’re human and eventually it wears on you a little bit. And, our first priority is of course these patients, and just trying to remember that, at the end of the day, when all these little tasks that are annoying pop up. So, I think it definitely is a stressor, not being able to care completely and properly for them, when all these little things like this are falling through the cracks and you want to have the patient be able to know that you know what’s going on.”* –Medical Assistant

*“Because, had it [an abnormal test that was not reported] been something awful [...] I remember being very panicked when I got it [...]. And so I was really shocked that number one I didn’t even receive it by paper, let alone a telephone call to say there was an abnormality on this exam [...] It was enough, it didn’t turn out to lead to a bad patient outcome in the long run, but it was enough to really scare me when I got the report and realized more things should have happened. I should have at least been aware, discussed it, and then obviously informed the family, none of which had happened in the interim.”* – Physician

*“There’s a lot of stress, and I think stress in terms of, there’s emotional stress because we all, you know, myself included, we feel that we’re not providing the best patient care that*

*we can. We're limited in our, the time of education, so it's almost as if, we're rushing through calls, just because I have so many others to make.” –Nurse*

#### **Theme 4: Need for Increased Staff**

Providers and staff recognized the overload of tasks and often expressed a need for more staff to meet workload volume:

*“Care coordination, if we had a full robust team of nurses, I feel like we could actually be ahead of the game.” –Nurse*

All clinics had responded to the problem of managing tasks by adding to their ancillary staff to the degree they were able, and these staffing increases had a noticeable improvement on task management:

*“So, I happen to have complicated enough kids that we eventually got a nurse specifically for [my] program, and that's all she does, and that has allowed us then to make sure that these things happen—that were not, they were almost 100% falling through the cracks before—and so now they do.” –Physician*

A recurring feature of successful teams was dividing clinic units into narrow foci so that staff could be dedicated to the nuances of a particular clinic:

*“Generally, our nurse coordinators, and I think it's probably different in every practice [...] within every little group like we are [...] and we have our own nurse coordinators, and they are very fastidious about looking ahead on the schedule, contacting people, and if there's an issue they always let us know. So, I think we probably do better than they're able to do in some departments, because first of all we're a small and cohesive group. It's more difficult if you have a [large] internal medicine clinic.” –Physician*

Even with small staffs, effective care coordination required active efforts to maintain continuity:

*“It’s always very helpful for somebody who’s going through, who has managed the InBasket all day, to go through and kind of clean it up before the next person comes the next day because [...] if you’ve been there all day managing it yourself then you just know exactly whether to postpone it, done it, whatever, so [...] I almost always postpone things only to myself on the days when I’m going to be there to follow up on it because I know it’s just going to take a lot less time for me to figure out what the next step is rather than for someone else to do that who has not been working on that issue.” –Nurse*

Clinics found the benefits of a focused, close-knit staff to be of such high priority that teams often accepted higher-credentialed personnel working on menial tasks in order to maintain better continuity of care:

*“I have somebody to really help us with it, now she’s a nurse and It’s probably not necessary, I probably don’t need that level, but in our division, it works better if you have one person who knows your patients and can follow it up. So, unfortunately, I have a nurse doing something that probably can be done, certainly by an MA, and maybe by even an [EHR] reminder [...] we don’t have the system in place such that it was reliable outside of that, so that’s what we’ve done, but it’s probably not the best use of resources. [...] Luckily [my division] understood that [...] both for safety but also very much for financial solubility of the institution [in situations where the institution would be liable for poor outcomes], if one person owns this [...] so finally they said ok, that makes sense, we understand. [...] But, for the other kids it just has worked really well and things don’t fall through the cracks anymore. If they could get a reliable system for me I’m happy to move over to a more appropriate use of skills, for some of the things, and I’ve tried.” –Physician*

The most extreme manifestation of using over-qualified personnel for continuity benefits was the physician in the outlier clinic that achieved a proactive workflow through personally devoting time to set up granular reminders. Other clinicians described a process of learning to delegate their tasks:

*“That is far better over the many years. That used to be a huge amount of my time in the last, like I said, I was slow to transition over to allow the nurse to really take over more.”*

–Physician

The preparation of records and tests for new patients showed improvement in management across clinics, where many specialties had experienced so many frustrations with incomplete referrals that they were willing to devote significant resources, up to direct physician involvement in the review of new patients:

*“[New patients would be inadequately prepared] a hundred percent of the time up until about a year ago. A hundred percent of the time, and I’m not exaggerating. I just think it’s incredibly rare that I EVER had the right results. That has also changed quite substantially. Part of that is because we had such a bad experience that we now have a physician, unfortunately, review every single chart that comes in, and that takes an immense amount of time. On the days that I’m on [...] I spend 2-4 hours a day just reviewing charts, before people come in. So, patients I’m not going to see and whatnot. It’s a huge burden, but it has substantially improved the data we get, because then we write a note that says, “Must have this, this, and this prior to them coming.” And now I would say about 80% of the time, we actually have the information we need, when that has been done. But that has only been done very recently, with physician review and then, very importantly, staff from the [scheduling] side.”* –Physician

Both physicians and staff report that even if they were relatively well-resourced that their staff was regularly operating at capacity, and additional loads on the system overloaded it quickly:

*“Our nurse coordinators, when they can, when they know there’s a patient who needs to have a lot of things done, they will usually try to call them a day or two before to make sure they remember. Or, if they were supposed to have it done before to make sure that it was. But, that’s a lot when there’s one nurse coordinator for several providers, when the clinics get busy it’s a huge workload for those nurses.”* –Physician

*“If we lose one of these [...] assistants, because she’s going to school and her position doesn’t get filled because of cuts, I mean, [that] will be terrible. You know, these admin and logistical processes are crucial. Things will just stop.”* –Medical Assistant

*“And right now, with what’s going on right now with coronavirus [the 2019-20 novel coronavirus pandemic], that’s having a huge impact on information flow, because nothing is flowing the way it should. You know, people aren’t there, things aren’t working well.”* –Physician

Another frequent effect of task overload was clinics shifting the burden for task management onto patients and families, even as providers and staff were uncomfortable with an inappropriate shifting of responsibility:

*“What I tell families—and this is too much to put on them—when you’ve had [the test], it’s unreliable that I will get the results, so please call my office.”* –Physician

*“They could be on three medications and each medication we’re either weaning, or titrating up. [...] We’re making real-time adjustments and parents get lost—they don’t understand. So we drop the ball on medication management.”* –Nurse

Concerns about placing the onus of inter-visit care on patients instead of on the clinic were not limited to the pediatric population:

*“Because right now we kind of depend on patients to be the managing thing in between visits as much as possible. [...] I mean, you know, we’re treating adults, [and] the patient does have some responsibility for their own care, but with a complex treatment plan that requires things between visits it would be being helpful. I think we would have better patient outcome and a lot less frustration on the part of the patient, if we would be more proactive in tracking that.” –Nurse*

Providers and staff estimated that between 10-30% of their patients did not have the skills to effectively self-manage inter-visit care, and that social determinants of health played a major role in the ability of patients to understand and self-manage a treatment plan:

*“But I would still say about a third, 30% are not tracking very well, what the plans are. Some of them have very difficult circumstances, and they might not have the wherewithal to manage something that’s going to require frequent follow-up, [for example] they are homeless, or they have mental health issues. That can trickle up.” –Nurse*

Frequent mentions of situations where patients had completed their tasks but other breakdowns in communication prevented the clinic from getting results, underscored the clinics’ perception that they needed more robust monitoring systems that did not depend on patients’ initiative.

### **Hopes for Improvement**

When asked what they would like to see improved, clinicians and staff reflected the same themes in the rest of their interviews, with a particular focus on the needs for proactive workflows, comprehensive monitoring (either by additional staff or by improved health IT tools), and interoperability. Clinicians were aware of the types of tasks that their staffs were completing, but not granular details about how the work was accomplished. All clinicians were pleased with the quality of the work their staffs were performing, but perceived a need for more individuals to complete the volume of work, while voicing understanding that adequate staff would be

economically unfeasible. The main request from staffs of their clinicians was that they provide more documented anticipatory planning and protocolize care where appropriate, to allow staff to work to the top of their license. Providers and staff in this academic medical center consistently described their frustrations in terms of an overwhelming overload of tasks in a chaotic system rather than assigning personal blame to individuals.

## **DISCUSSION**

Our qualitative interviews revealed four major themes related to inter-visit care: inadequacy of tools, sequelae of poor interoperability, reactive workflows, and need for increased staff. Participants from all clinics except for one perceived inter-visit care to be a major stressor—the remaining clinic represented the extrapolation of the trend we observed that clinics benefitted from increased staffing and an upward shift of work to higher-credentialed team members. The improvements in inter-visit care management tracked with increased resources, which held between clinics in our sample and within clinics when respondents described positive effects of recent interventions to provide more staffing. However, resources devoted to successful inter-visit care interventions described by our interviewees would be unattainable for the vast majority of clinics (at our institution and, indeed, nationwide).

The relationship between inadequate staffing/EHR support and consequences of reactive workflows indicates that frustration, inefficiency of resource utilization, and compromises to optimal patient care are emergent properties of ambulatory care's inability to effectively manage the myriad tasks and interdependent actions of multiple contributors to patient care. The reliance of team members at multiple levels performing tasks that superficially appear below their training suggests that inter-visit task management involves higher-level cognitive and clinical decision-making than purely administrative task completion. Alternatively, the inability of current EHR tools and clinic workflows to separate administrative tasks from areas of potential patient harm that

require medical oversight may be a contributor to shifting the burden of task management up to higher-credentialed team members. Due to a pervasive sense of overload in task volume, most clinics could not be comprehensive in their task management and so had to prioritize resources where providers were, in some nebulous sense, “worried about” certain patients, which introduced the requirement for medical judgment in what should ideally be administrative work.

The qualitative nature of this study allows for an evaluation of the convergence of multiple factors in inter-visit care as they affect clinics, and the evaluation of dual perspectives of provider-staff dyads captures the interaction of both the clinical and administrative aspects of clinical tasks. The incorporation of a variety of ambulatory specialties identified commonalities in inter-visit care that transcended details related to the type of tasks, their urgency, or the required time to completion.

Physician and staff focus on disruption and inability of their current workflows to manage change were likely somewhat over-represented as our interviews were taking place in the immediate period of adjustment to virtual visits with the onset of COVID-19 safety restrictions. However, similar themes of disruption were also mentioned on a smaller scale as occurred with personnel changes, fluctuations of complexity of patients, or other unforeseen events, indicating that the brittleness of care coordination systems is a stable theme independent of the timing of the study.

As a single-center study, our findings are necessarily limited. The scope of this work does not address the management of inter-visit care outside of the paradigm of ambulatory clinics directly affiliated (and co-located) with an academic medical institution whose faculty provide care and comprised the physician representatives for this study. While we endeavored to sample a wide variety of clinical workflows that reflect the management of different underlying pathophysiologies, all clinics are working under the aegis of a single institution which would influence organizational culture and institution-specific strategies regarding staffing and change

management (of note, some clinicians who previously worked in other settings volunteered that they encountered similar issues elsewhere).

While this study invited clinicians and staff to speak to multiple aspects of inter-visit care, our providers' subjective reports closely mirrored quantitative studies on component aspects. Patient non-adherence and inability to understand providers' plans were discussed frequently among our respondents, in keeping with reported rates of adherence and patient self-administration errors.<sup>3-5</sup>

As our participants shared a common EHR that meets current standards for notification of lab results, our findings are not reflective of earlier work that shows higher rates of non-engagement with returning lab results,<sup>6</sup> but providers describing difficulties with partially or non-interoperable systems acknowledge higher risks for missed lab work compared to data collected and reported within the provider's institution. Similarly, Adams et al examined patient safety events attributable to interoperability, finding similar emphasis on problems with incoming radiology and lab work as our providers experienced.<sup>21</sup> Some differences in their findings follow from differences in population and study focus, for instance they studied events reported to a statewide system and found 62% of interoperability-related adverse events related to interoperability within a healthcare organization; in contrast, ours was a single-site study and has an institution-wide integrated enterprise EHR so interoperability challenges occurred between organizations. While medication events constituted a plurality of their interoperability errors, in the ambulatory setting patients are more likely to notice not having access to a prescription and thus contact the clinic promptly, so our questions on missed tasks led providers to focus on labs and imaging reports failing to reach them. The tendency for physicians in our study to ask patients or families to remind the clinic of lab results indicates the adaptation of their workflows to cope with the shortcomings of information exchange, which reflects compensatory measures to address difficulties with lab follow-up and interoperability reported in existing patient-safety literature.

Although not all staff members in our study had the title of care coordinator, they performed similar work and their impact on patient care aligned with prior studies.<sup>7-9</sup> Our work did not seek to quantify patient outcomes, but providers' subjective impression that fewer missed tasks occurred with more staff providing a care-coordinating role would imply that the reduction in missed tasks should improve patient outcomes, as has been shown in previous research. Descriptions of workflow from both clinicians and their staff in our study strongly supported prior findings on the high resource utilization that hindered care coordination programs from delivering their clinical benefits in a cost-effective manner.<sup>15</sup> In keeping with our findings of care coordination successes deriving from high resource investment, Ronis et al conservatively estimated that the staffing costs incurred with effective care coordination per medically-complex child per year equaled 4.2 Emergency Department visits or 1 night of inpatient hospitalization.<sup>17</sup> In particular our interview responses agreed with Ronis et al's findings of major resource drivers, namely the very manual nature of care coordination (especially chart review), the need for significant planning and intra-team communication overhead, and the dependence on dedicated staff.

Our study did not directly assess for burnout, but interviewees' description of their stressors and time spent in the EHR is consistent with the existing burnout literature.<sup>18</sup> In particular, Tran et al evaluated time spent on administrative tasks via EHR time logs, but our participants' reports of additional, manually-maintained patient management artifacts outside of the EHR indicate that these time logs underestimate the scope of the problem. Depersonalization is well-described as a symptom of burnout,<sup>22</sup> but our respondents' descriptions of their task management even indicate a depersonalizing effect of their workflows that may be a provoking factor in burnout. Respondents report being so overwhelmed with individual minutiae of task management that they notice they are not relating to patients as individuals, but rather as lists of tasks, which they describe in terms indicating guilt for this discrepancy between their desire to be compassionate caregivers and the realities of how they handle high workloads.

While we expected to find reports of stressors consistent with the physician burnout literature as relates to time-consuming task and work overload, an unexpected and significant finding was how directly stressors related to inter-visit care evoked statements about moral injury. Initially coined to refer to combat veterans' psychological responses to their experiences in wartime,<sup>23</sup> moral injury describes distress as a result of the violation of an individual's closely-held ethical codes. Increasingly, physicians have advocated for greater awareness of moral injury in the medical profession, either contributing to burnout or as a distinct phenomenon with overlapping features that mimic it.<sup>24</sup> Physicians may experience moral injury from being unable to offer optimal patient care within the constraints of the larger medical system,<sup>25</sup> which was clearly demonstrated in our cohort. From regret at having to depersonalize patients in order to manage a large volume of discrete tasks, to embarrassment at having to shift the burden of lab review to patient-initiated contacts, to fear of missing a critical step in workup that could lead to patient harm, to guilt over actual remembered failures of inter-visit care, our providers and their staff expressed that the challenges of inter-visit care weighed heavily on them.

Further investigation of different institutions, regions, and payment models for the delivery of ambulatory care may reveal more variability in inter-visit care practices and effects on patient care. While our participants subjectively report improvement on their inter-visit care management with addition of staff, formal pre- and post-intervention analyses may quantify this value in greater detail. This study does not attempt to quantify gaps in inter-visit care or compare objective tracking to providers' perspectives.

## **SUMMARY AND CONCLUSIONS**

Inter-visit care is a highly complex component of ambulatory medical practice, demanding large investment of resources. Our qualitative interviews revealed common themes of inadequacy of tools, sequelae of poor interoperability, reactive workflows, and need for increased staff. These

contributed to a feeling of overload, impacts on clinics' interaction with their patients, and moral injury on the part of providers who could not manage inter-visit care to their personal and professional standards. Improvements in inter-visit care were often achieved with expensive and non-scalable staffing solutions.

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