

## Lessons Learned from healthfinch's Charlie Practice Automation Platform: Evaluation Follow-up



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## BACKGROUND

In our evaluation report (Aug 2018) to the California Health Care Foundation (CHCF), we documented the positive experiences of two clinics across the areas of technology adoption and clinical efficiencies resulting from use of healthfinch's Charlie Practice Automation Platform. The Charlie Practice Automation Platform reduces inconsistent refill orders by applying evidence-based protocols to the request as it enters the electronic medical record. The software also checks for duplicate requests and contraindications using the patient's active medication list before delivering it to a nurse, medical assistant, or physician for approval. Finally, Charlie's care gaps functionality has the potential to help pharmacists streamline their work and can save them time from manually scanning a medical chart by identifying overdue or upcoming labs and recommended visits that need to be addressed in the next ninety days. Taken as a whole, streamlining work flows across these administrative activities can save health care providers valuable time so they can focus on patient care.

To better understand the potential for implementing this technology among safety-net providers in California, CHCF and healthfinch collaborated with two health centers: Alliance Medical Center (AMC) in Sonoma County and QueensCare Health Centers (QHC) in Los Angeles County. Both health care systems are members of OCHIN and have implemented healthfinch's refill technology through OCHIN's cloud-based Epic platform. We documented sites' experiences across two areas: technology adoption and clinical efficiencies resulting from use of the Charlie platform, including clinical efficiency metrics, changes in work flow, feedback from staff on platform implementation, program implementation challenges faced from the perspectives of the pilot sites and vendor, and lessons for the field.

Our evaluation documented pre-to post-implementation improvements across a number of clinical efficiency measures for staff and patients (i.e., same day refills, refills completed by nonproviders, productivity) as well as gaps in patient care that otherwise would have been missed (i.e., overdue/recommended office visits and labs). As we described in our August 2018 evaluation report, staff at both sites did not have access to the care gaps functionality at the time we prepared our report. For QueensCare Health Centers, clinical pharmacists received access to this functionality in September 2018, while providers at Alliance Medical Center received access to the care gaps functionality in late December 2018.

## FOCUS OF EVALUATION FOLLOW-UP

The purpose of this evaluation follow-up is twofold: First, to re-analyze the prescription refill metrics data that we presented in our original report, since we have another seven months of post-implementation data available to report on potential longer-term impacts; and, second, to

document trends in identified care gaps resulting from the availability of this new functionality to providers. While we were able to report on initial descriptive data in care gaps identified by the Charlie platform, we could not report on care gaps metrics following staff access to this functionality.

To supplement the quantitative analyses, we also conducted follow-up interviews with Marina Snitman, PharmD, Director of Pharmacy, and Cecilia Wu, PharmD, Clinical Pharmacist at QueensCare, and Mary Fitzgerald, RN, BS, MPA, Clinical Consultant at Alliance Medical Center, to gain longer-term insights about the added value of the Charlie platform.

## FOLLOW-UP RESULTS

### Clinical Efficiency Refill Metrics

We conducted trend analyses of the extended prescription refill metrics (i.e., same day refills, refills completed by nonproviders) to document any longer-term trends in these measures beyond the five months of post-implementation data we presented in our original report; findings are presented for both demonstration sites. We used interrupted time series (ITS) analysis to evaluate the impact of the Charlie automated refill platform on these clinical efficiency metrics. The study design used is ideal for ITS analysis, since it relies on longitudinal data before and after an intervention occurs—in this case, the Charlie Practice Automation Platform. Specifically, we used segmented linear regression to document changes in refill practices before and after the automated platform was implemented, using the following equation:  $Y_t = \beta_0 + \beta_1 * \text{time}_t + \beta_2 * \text{intervention}_t + \beta_3 * \text{time after intervention} + e_t$ , where  $Y_t$  equals the outcome of interest (i.e., prescription refills in month  $t$ ),  $\beta_0$  documents the baseline level of prescription refills,  $\beta_1$  estimates the baseline trend in prescription refills independent of the Charlie prescription refill platform,  $\beta_2$  estimates the impact of the prescription refill platform on prescription refills immediately following implementation, and  $\beta_3$  estimates the change in trend of prescription refills post-implementation of Charlie compared with the trend before implementation of Charlie.<sup>1,2,3</sup>

In general, the longer-term results across both pilot sites were consistent with the results in our original report. The percentage of same day refills significantly increased from an average of 57% per month before Charlie was implemented to 68% per month after Charlie was implemented at Alliance Medical Center ( $R^2=.42$ ,  $F(3,14)=5.12$ ,  $p<.05$ ). Note in the chart below

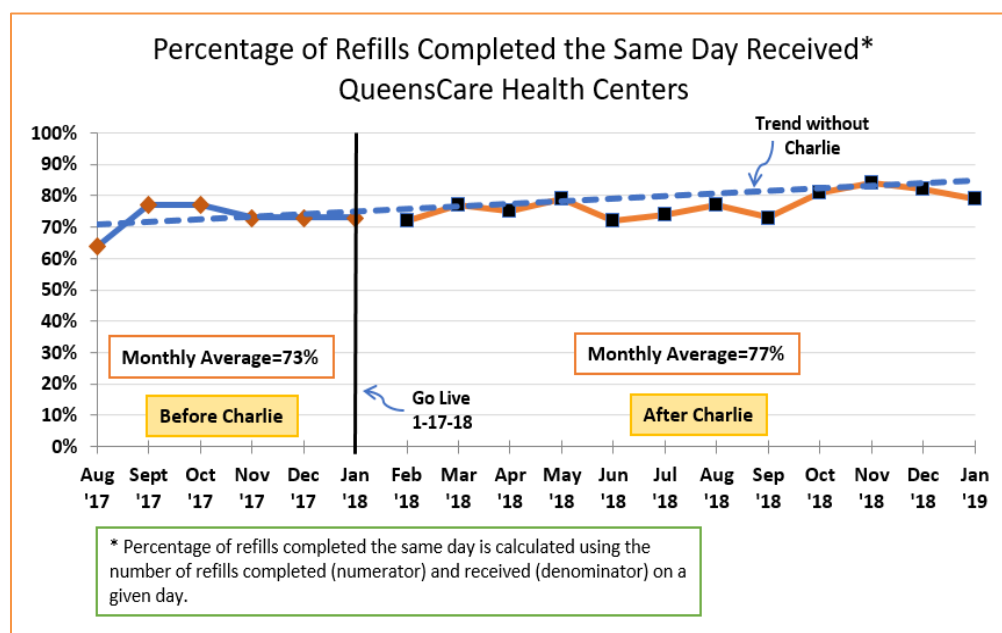
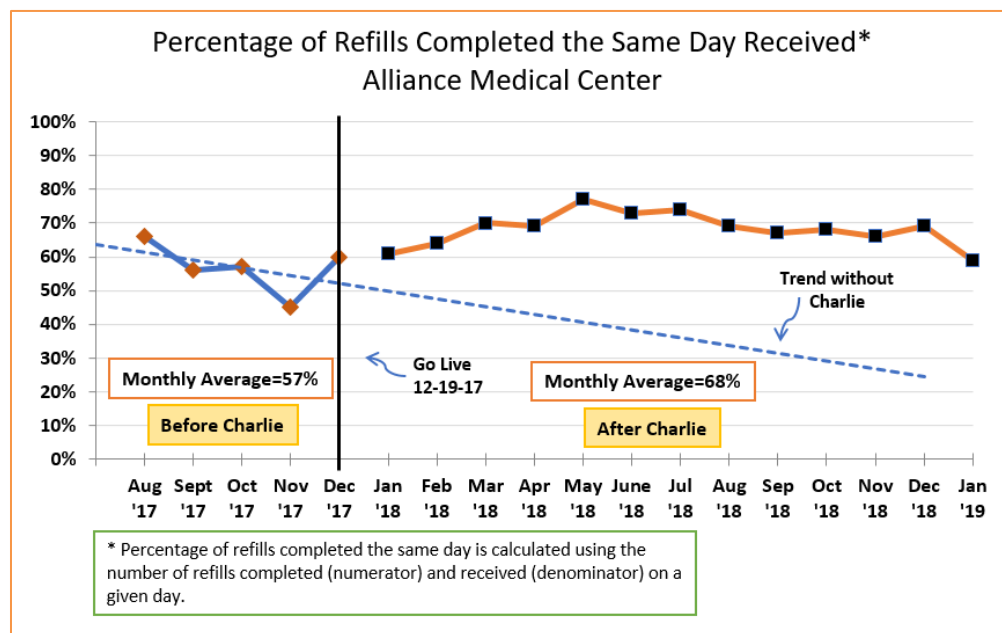
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<sup>1</sup> Lagarde M. How to do (or not to do)... Assessing the impact of a policy change with routine longitudinal data. *Health Policy and Planning* 2012; 27: 76–83. doi:10.1093/heapol/czr004

<sup>2</sup> Wagner A, Soumerai S, Zhang F, and Ross-Degnan D (2002). Segmented Regression Analysis of Interrupted Time Series Studies in Medication Use Research. *Journal of Clinical Pharmacy and Therapeutics* 27: 299-309. 10.1046/j.1365-2710.2002.00430.x.

<sup>3</sup> Cochrane Effective Practice and Organisation of Care (EPOC). Interrupted time series (ITS) analyses. EPOC Resources for review authors, 2017. Available at: <http://epoc.cochrane.org/epoc-specific-resources-review-authors>.

that same day refills were actually decreasing by about 2.3% per month before Charlie was implemented. Results indicate that while there was no statistically significant month-to-month change in the percentage of same day refills, either before or after implementation of the platform at Alliance, immediately after implementation of the platform the percentage of same day refills increased significantly by about 17% per month ( $t=3.01$ ,  $p<.01$ ). Eighty-eight percent of refills were completed within 3 days following Charlie's implementation (data not shown).

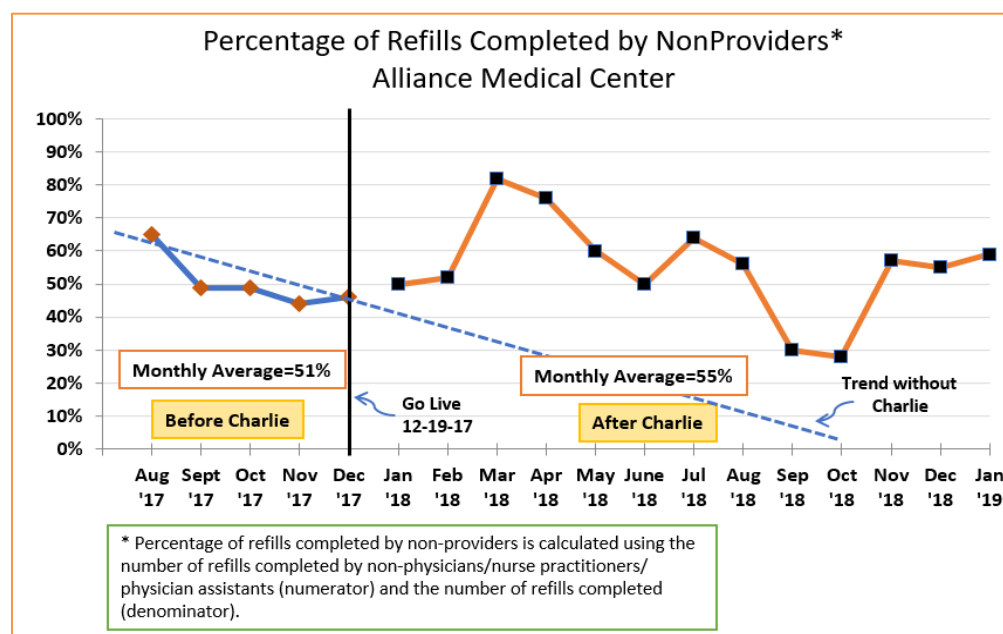


For QueensCare Health Centers, improvement in same day refills was also documented, although the increase was not statistically significant. The percentage of same day refills

increased from an average of 73% per month pre-implementation to 77% following Charlie's implementation. Ninety-six percent of refills were completed within 3 days following Charlie's implementation (data not shown). While the trend did not change much following implementation of Charlie at QueensCare, the trend continues to gradually increase following implementation of Charlie (see chart above). This gradual change may be due to the fact that QueensCare already has a dedicated pharmacy staff in place. According to Lesley Hobson, RN, Director of Clinical Optimization at healthfinch, at QueensCare there are 2.6 FTEs dedicated to just prescription refills covering about 30 providers, so the team already has the capacity to support good turnaround time. Because the team consists of clinical pharmacists who have prescribing privileges, not as many prescriptions have to be sent back to a provider for approval, which also reduces turnaround time.

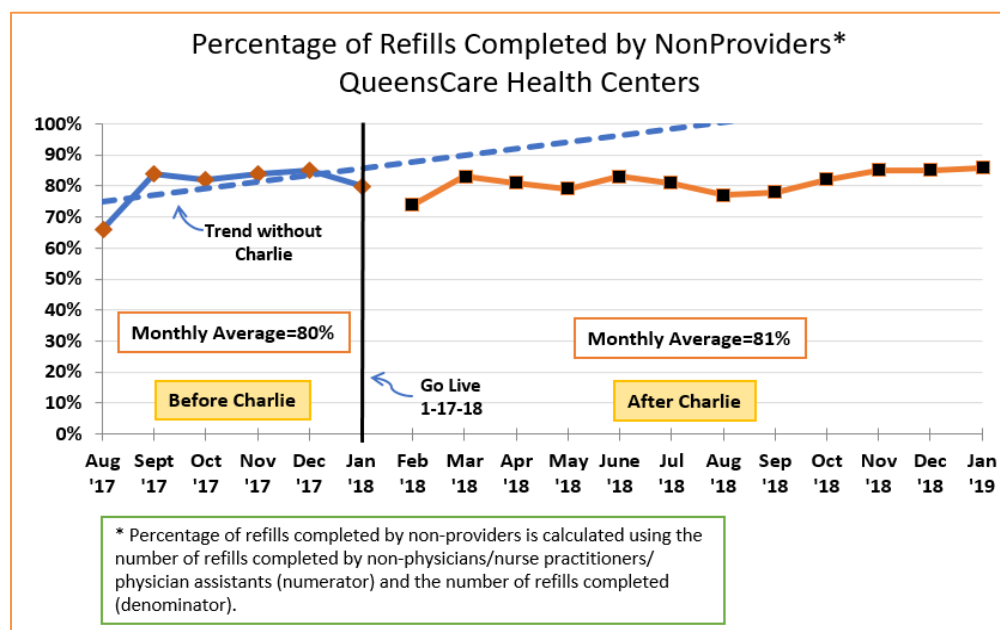
It is also important to note that the percentage of same day refills post-Charlie implementation is higher at both sites in comparison to other healthfinch clients. According to Lesley Hobson, RN, the average same day refill percentage post-implementation is about 54% across other healthfinch clients (L Hobson, personal communication, March 6, 2019).

The percentage of refills completed by nonproviders (another measure of clinical efficiency) at Alliance Medical Center increased from an average of 51% before implementation of Charlie to 55% after implementation of Charlie (see chart below). Similar to same day refills, the percentage of refills completed by nonproviders decreased by about 4.3% each month before implementation of Charlie. Results indicate that while there was no statistically significant month-to-month change in the percentage of refills completed by nonproviders, either before or after implementation of the platform at Alliance, immediately after implementation of the platform the percentage of refills completed by nonproviders increased by about 15% per month, reaching borderline significance ( $t=2.00$ ,  $p=.07$ ).



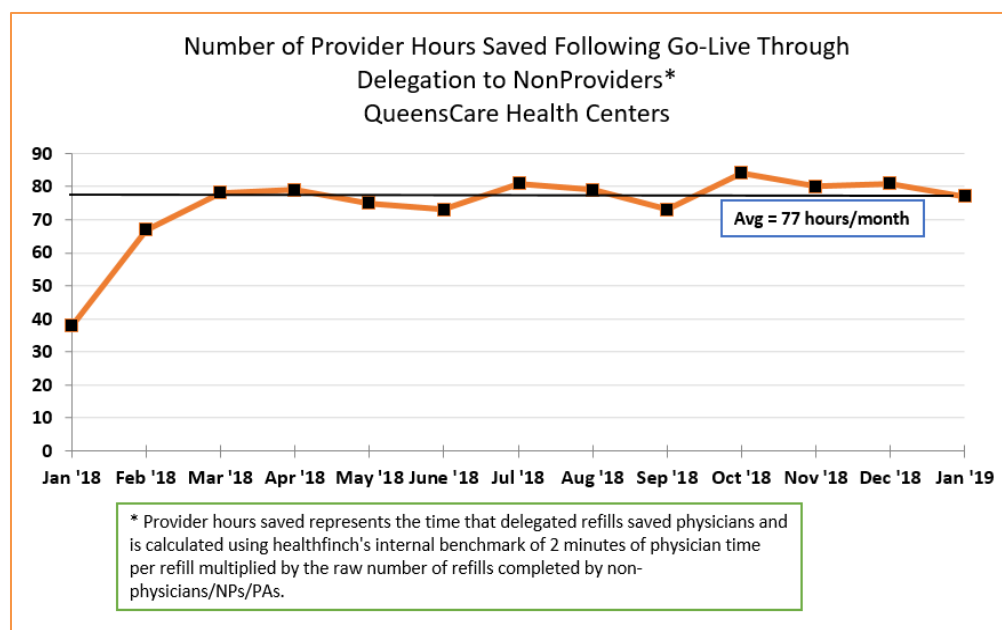
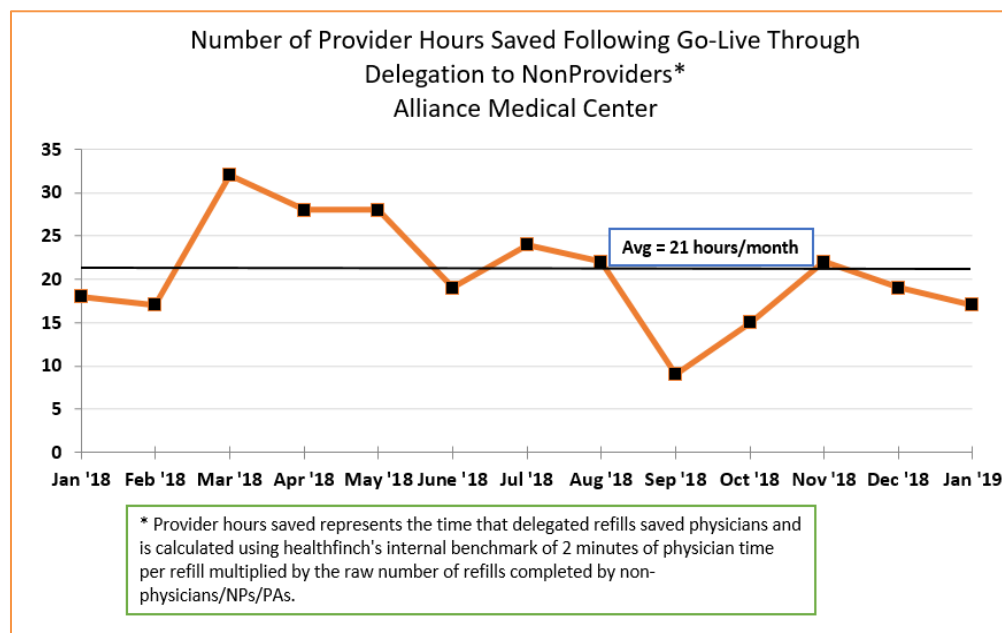
The percentage of refills completed by nonproviders at QueensCare Health Centers increased slightly from an average of 80% before implementation of Charlie to 81% after implementation of Charlie (see chart below). There was actually a borderline significant dip in the percentage of refills completed by nonproviders immediately following implementation of Charlie ( $t=-2.00$ ,  $p=.07$ ), dropping from 80% before Charlie was implemented to 74% immediately after Charlie was implemented. As we noted in our original report, according to Lesley Hobson, RN, this short-term drop post-implementation may have been due to the absence of a protocol in place initially for the clinical pharmacists. “Because clinical pharmacists have prescribing privileges and do not necessarily have to follow a protocol as strictly as a nurse or pharmacy tech would, decisions were made based initially on the individual pharmacist’s discretion. However, when the team began diving into the protocols and discussing the risks of some of the medications, such as antipsychotics or even medications on the cusp of being a controlled substance (e.g., gabapentin), some of the pharmacists began routing the refill requests back to the providers, resulting in lower nonprovider refill percentages.”<sup>4</sup> However, as we noted in our original report, over time this percentage has begun to gradually increase again.

Also, as we noted in our original report, there may not be much room for more improvement with this measure for QueensCare for two reasons: First, given the high baseline delegation percentages already in place, this site focused more on implementing a standardized protocol to enable pharmacists to work in alignment. Second, the fact that clinical pharmacists still send back controlled substances refill requests to providers consistently also would stabilize this percentage over time. According to Ms. Hobson, it’s not unusual for 15-20% of refill requests to fall into the controlled substances category.<sup>4</sup>



<sup>4</sup> Emont S. Lessons Learned from Implementation of healthfinch’s Charlie Practice Automation Platform: A Case Study. August 2018. California Health Care Foundation internal document.

Finally, we documented labor hours saved among physicians through delegation of prescription refills to nonproviders. Physician hours saved represents the amount of time saved through delegation of the refill process to nonphysicians and was calculated using healthfinch's internal benchmark of 2 minutes of physician time per refill multiplied by the raw number of refills completed by nonphysicians. Although there was a slight decrease over time in monthly labor hours saved due to staffing issues at Alliance Medical Center during implementation of the automated platform, an average of 21 hours were saved each month following implementation of the Charlie platform. At QueensCare Health Centers, labor hours saved among physicians gradually increased each month for the 12-month period following implementation of Charlie, with an average savings of 77 hours each month (see charts below).





## Care Gaps Recommendation Metrics

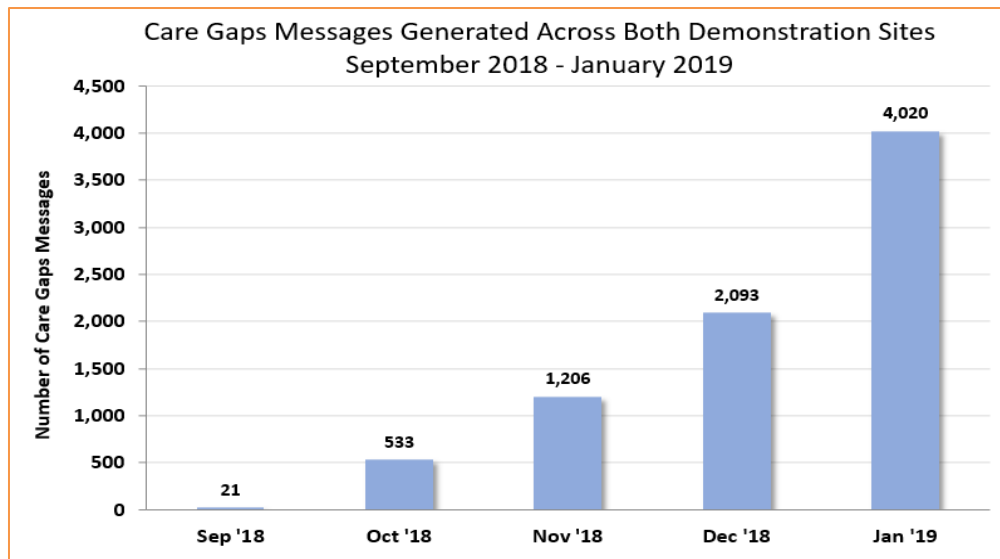
As we discussed in our original report, the care gap function of Charlie not only identifies overdue labs and office visits, but also recommends labs and office visits that need to be addressed in the next ninety days. This can help with patient adherence to recommended screenings and aid in reducing backlog of overdue visits and labs. Once the care gaps are identified, a separate encounter can be created within the patient's chart to address these needs. Since many health care clinics already experience access issues for their patients, the healthfinch team expanded this care gap window to ninety days to help improve patient access to appointments. The end result is to ultimately improve access to timely care but also is intended to streamline patient visits where possible. By closing these care gaps, clinical outcomes—like better control of a1c levels or blood pressure control—could be within reach the longer the healthfinch platform is used to manage the patient population.



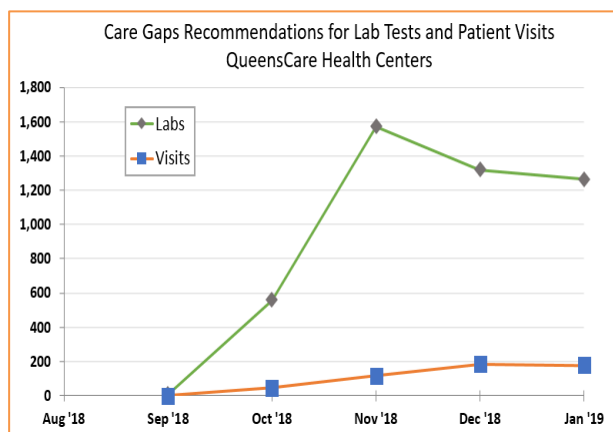
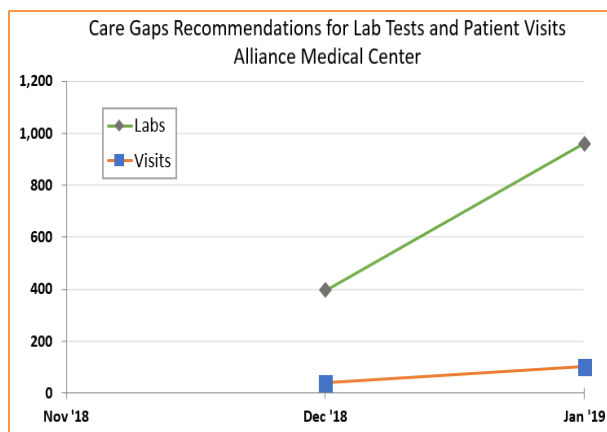
We documented trends in recommendations for labs and office visits flagged by the Charlie platform, as well as trends for selected quality laboratory screenings for diabetes patients, including HbA1c, lipid panel, and microalbumin screenings. Since healthfinch staff is still working on storing data that differentiates overdue vs. upcoming labs and office visit recommendations, we are able to present data at this time only on the total recommendations flagged by Charlie. However, over time it is expected that fewer recommendations for overdue office visits/labs would be flagged by Charlie, as these recommendations are resolved by office staff and providers.

Between September 2018 and January 2019, the Charlie platform generated over 7,800 care gaps messages across both demonstration sites. As shown in the bar chart below, care gaps messages generated by Charlie increased dramatically over this time period as more patients were being identified and flagged for labs and office visits after the automated system went live at both sites (September 2018 for QueensCare and December 2018 for Alliance).

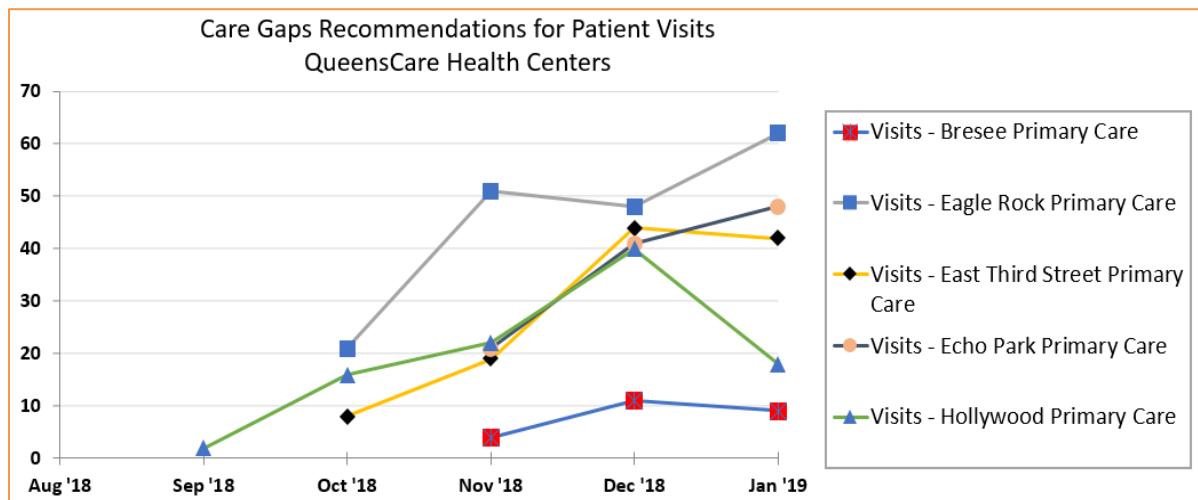
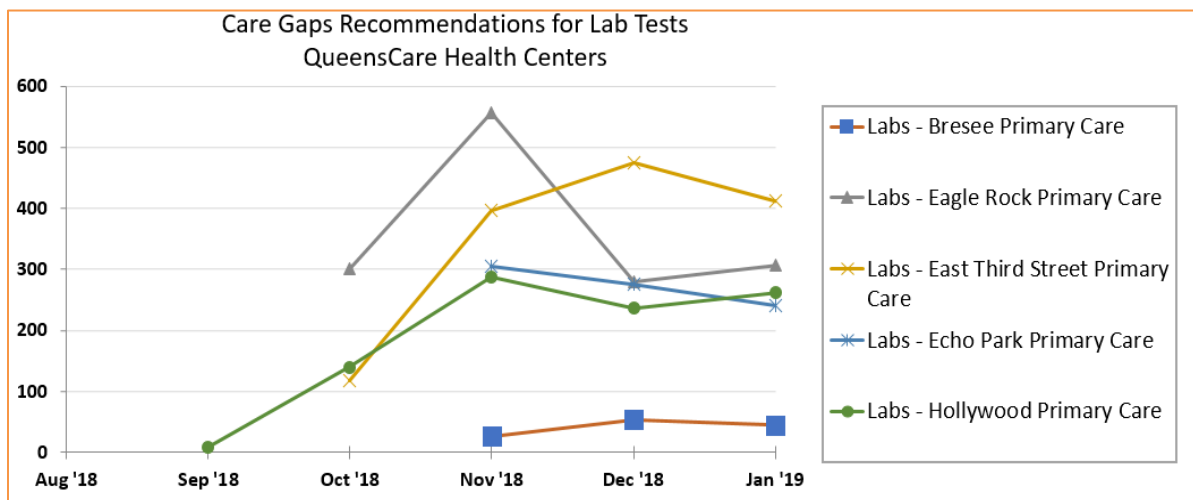
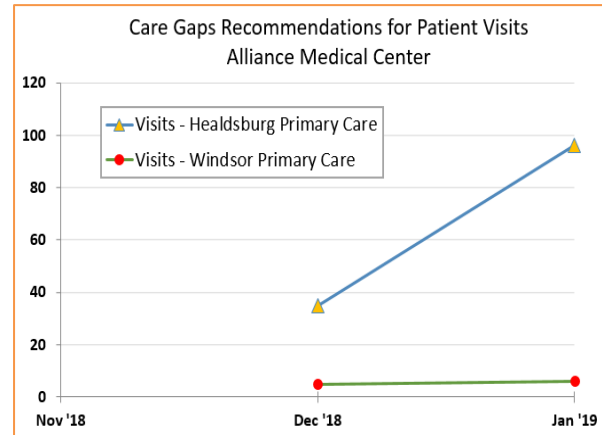
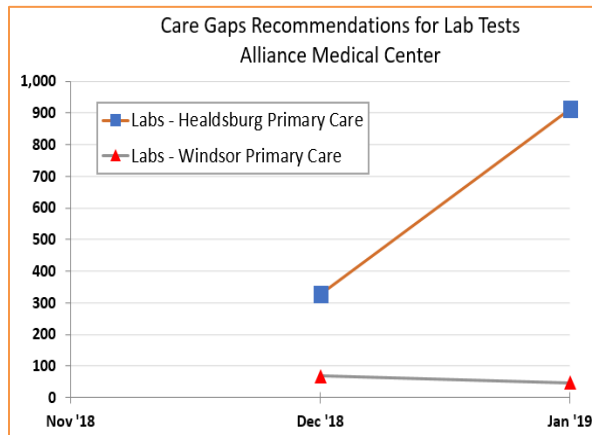




As shown in the side-by-side charts below, care gaps recommendations are presented for both demonstration sites for labs and patient visits. Although both sites have had access to this functionality for a short period of time—with Alliance receiving more recent access—clinical teams at both sites have recently begun to use this functionality to get ahead of the backlog of patients who have been flagged for these various screenings. At QueensCare, the trend illustrates that care gaps recommendations began to level off and gradually decline beginning in November 2018. This is due to the fact that the same recommendations for care gaps are flagged once every 60 days for a patient even if a new prescription is filled for that patient (unless a new recommendation is coming due). Again, it is anticipated that over time, it is expected that dips in trends in lab and office visit recommendations will be observed for both sites as more patients with refill requests are flagged for these recommendations and patient adherence with these recommendations improves. It is important to underscore that the rate-limiting factors at that point are staff time in contacting patients to follow-up and patient adherence to these screening recommendations.

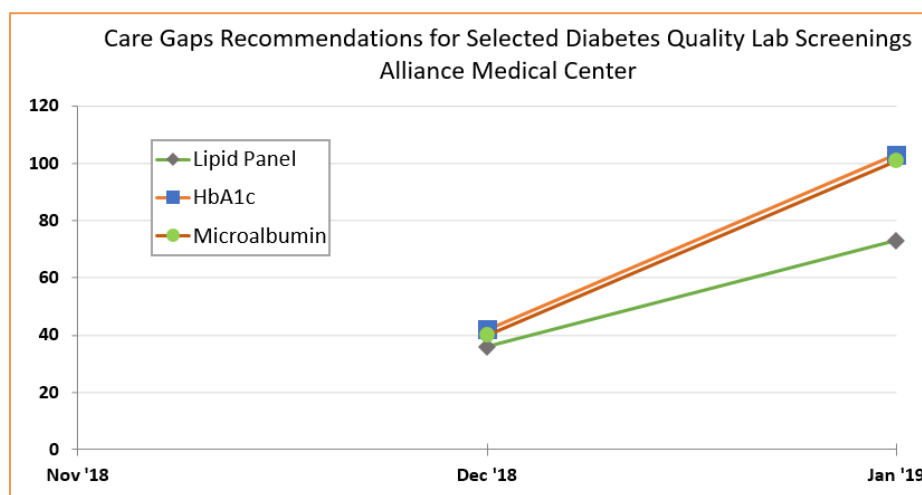


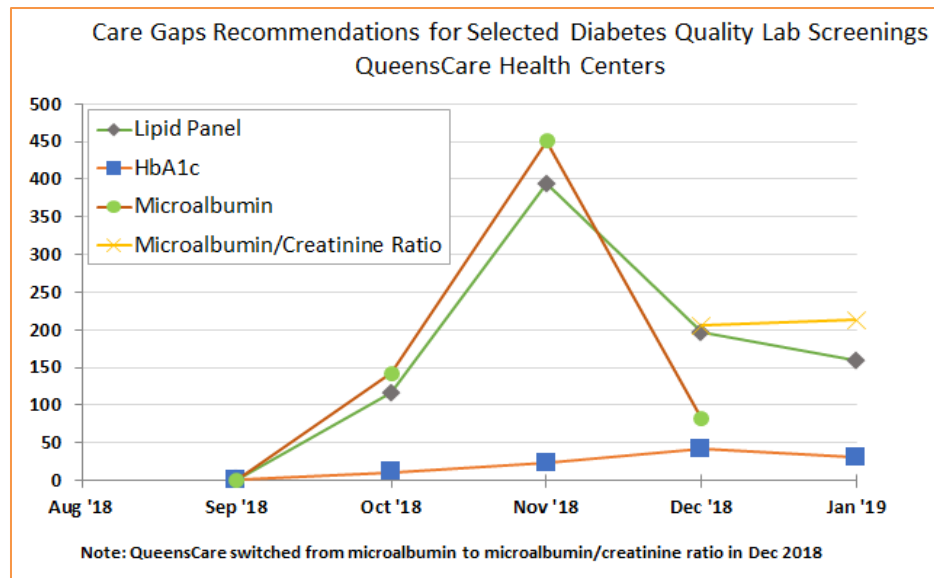
Care gaps recommendations are presented below for lab and office visits for each clinic location that has access to the Charlie platform at each of the two demonstration sites—two clinic locations for Alliance and five clinic locations from QueensCare.



The clinic site-level trends on recommendations above more clearly show leveling off of the flagged lab and office visits experienced for many of the clinics' patient populations—particularly for QueensCare since this site has had access to this functionality for a relatively longer period of time compared to Alliance—and, again, illustrates Charlie's ability to flag these recommendations for the patient populations at each clinic.

As described in our original report, monitoring trends for selected quality laboratory screenings for diabetes patients, including HbA1c, lipids, and microalbumin screenings can contribute to improving the overall health of the patient populations served by these clinics, as these care gaps are identified and resolved by office staff and providers. As we also reported in our original report, revenue gains from closing care gaps are also possible once this functionality is utilized to its full potential by each of the clinics (as is the potential to improve quality metrics like HbA1c screening based on the identified care gaps). The trends in these quality measures are similar to the overall trends in lab recommendations observed across the two demonstration clinics (see charts below). Again, as the clinics begin to gain control over these performance measures and improve clinical quality of care, it can be expected that optimal diabetes management will be in reach (as well as management of other chronic conditions), leading to better health outcomes. While it is too early yet to document any improvements in patient adherence with these recommendations, the results presented here are promising and illustrate the platform's ability to identify and flag lab recommendations for specific chronic illnesses like diabetes. Longer-term tracking of patient cohorts would be needed to document patient adherence to these quality metrics.





## Staff Experiences in Using the Charlie Platform

Our interviews with leaders from both demonstration sites continue to be positive and reinforce the importance and usefulness of the Charlie platform, as well as the partnership with the vendor (healthfinch). At Alliance, Mary Fitzgerald, RN, BS, MPA, Clinical Consultant at Alliance Medical Center, reported positive experiences around clinical efficiency and workflows resulting from implementation of the Charlie platform. In our original report, Ms. Fitzgerald reported that since AMC's patient population has many complex medical conditions, the clinical team is finding that, even though patients may fit the protocols, a majority are out of compliance with a number of practice guidelines and/or care services and this continues to be the case. We also reported initially that Alliance was short-staffed and had experienced limitations with keeping up with prescription refills. Over the summer, three full-time LVNs were hired across both clinics (one at Windsor and two at Healdsburg). In addition, in September 2018, a .6FTE pharmacy technician was hired, and according to Ms. Fitzgerald, does most of the heavy lifting around prescription refill requests and contacting patients for follow-up. So that drawing down overdue recommendations flagged by Charlie has begun but will likely take some more time to document noticeable impacts.

Not surprisingly, the biggest rate-limiting factor on reducing overdue recommendations is patient adherence to screening recommendations. Staff reports this as an ongoing challenge, despite having tried innovative ways to contact patients about their overdue screenings. For example, Ms. Fitzgerald points out that despite repeated attempts at contacting patients over a few weeks for overdue labs (which even includes sending a letter to patients after repeated call attempts), about half of patients still do not respond. Staff is now considering having a lab draw station at the clinic, so that labs can be drawn at the same time as a scheduled visit or when the patient needs to come back for a prescription refill at the pharmacy, saving the patient (and

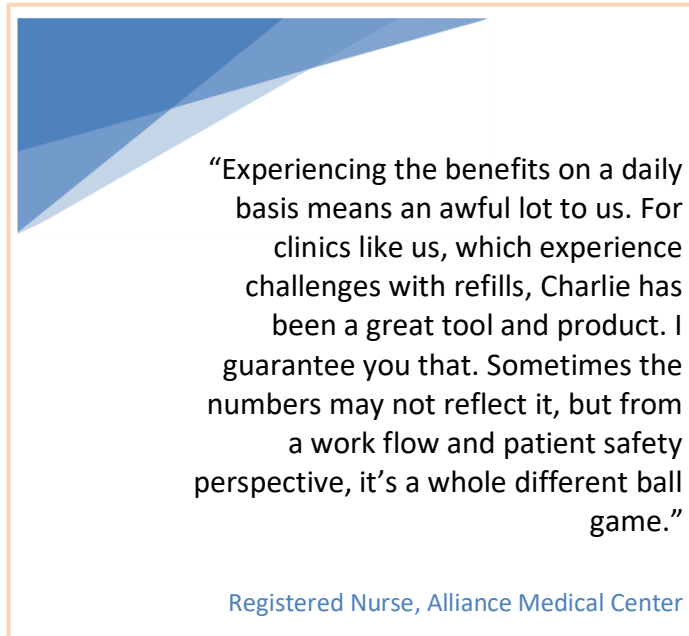
staff) an extra visit. Ms. Fitzgerald believes this change in work flow can improve patient adherence by 75%.

Ms. Fitzgerald notes the importance of their partnership with healthfinch. She has reported that healthfinch staff has been very responsive to any emerging issues and notes that Lesley Hobson, RN, has been “a great ambassador for the company.”

Staff at QueensCare also reported continued, positive improvements in clinical efficiencies around refills and care gaps identification. We had an opportunity to interview Marina Snitman, PharmD, Director of Pharmacy, and Cecilia Wu, PharmD, Clinical Pharmacist at QueensCare in our follow-up interview. The pharmacy team has noticed that in the past few months the refill volume

has decreased since Charlie has been implemented. For example, Dr. Wu notes that at baseline, the majority of patients would have an average of 5-8 refills per refill request compared to a current average of 1-2 refill requests per patient. This has contributed to the reduction in turnaround time since Charlie has been implemented. Dr. Wu also notes that the number of medications may not be indicated in the number of refill requests, since any number of medications will trigger a refill event regardless of the number of medications needing a refill. So, according to Dr. Wu, the Charlie platform has been helping to draw down any backlog in refills.

In our original report, we also noted that QueensCare focused the Charlie pilot primarily on implementing a standardized protocol to enable pharmacists to work in alignment as opposed to a primary focus on increasing same day refills or nonprovider delegation percentages, since these metrics were already high at baseline. In the first few months following implementation of Charlie, we noted that clinical pharmacists were hesitant to completely rely on the protocols and ended up manually scrubbing patient records anyway. Since then, however, Dr. Wu notes that staff has felt more comfortable with the protocols and are able to move through the refills more efficiently this way, but still access patients’ charts as needed. As Dr. Wu notes, “We trust the system a bit more.”



In terms of care gaps identification, the QueensCare team also has reported a greater comfort level with this functionality. As Dr. Wu notes, when Charlie was initially implemented, staff spent more time on following through and ordering the care gaps recommendations for patients (e.g., ordering overdue labs). Now, staff has noticed that many of the recommendations have been ordered already, resulting in a streamlined process. Not

“One thing we can never control is patient behavior. We will always have patients that are reluctant to come in for their labs. So, that’s always our biggest challenge with the care gaps recommendations.”

Clinical Pharmacist, QueensCare Health Centers

surprisingly and similar to AMC staff’s observations, however, QueensCare staff has observed that while Charlie has done a great job in flagging patients and recommending various labs and office visits, they have no control over patient compliance with these recommendations.

Finally, the results of a recent survey of clinical pharmacists at QueensCare conducted in January 2019 by healthfinch reflect the observations noted above. About 50% of

respondents reported that Charlie saved them up to a minute per refill encounter when scrubbing the patient’s chart for overdue care gaps. An additional 25% reported it saved them up to 5 minutes per refill encounter, and 25% reported it saved them up to 10 minutes per refill encounter. Three of four clinical pharmacists rated a “4” or higher on a scale of 1 to 5 (where 1=“not easier” and 5=“remarkably easier”) that it was easier to place lab orders with the Suggested Orders workflow (i.e., to streamline workflow). Finally, one pharmacist commented that “Refills are easier to review, take less time to authorize, and Care Gaps with suggested Lab Orders are very helpful and save time.”<sup>5</sup>

Moving forward, Marina Snitman, PharmD, Director of Pharmacy, noted that the team is interested in adding other care gaps to the system to further improve clinical efficiency. Dr. Snitman also notes that the Quality Department at QueensCare is very interested to see what care gaps can be identified to meet certain quality metrics, once this piece is “ironed out.”

## CONCLUDING REMARKS

Our follow-up evaluation findings reinforce the findings presented in our original report to CHCF, and suggest a strong potential for implementing this type of technology among safety-net providers. Our evaluation documented longer-term pre-to-post-implementation clinical efficiency improvements across prescription refill management. We also documented trends in care gaps for flagged labs and office visits and report positive feedback from staff who have recently started utilizing this new platform functionality.

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<sup>5</sup> Hobson L. Post-implementation online survey of QueensCare clinical pharmacists on their experiences with Charlie. Administered January 2019. (internal document)

As we have previously reported, it is important to note that many clinics care for medically complex patients, which can push the limits of Charlie's efficiency, so that manually scrubbing a medically complex patient's chart is still necessary despite the medication protocols that are put into place to streamline this process. However, staff at both pilot sites consistently reports overall improvements to clinical efficiency in using Charlie. And, over time, the care gap functionality features could potentially have a positive impact on management of high risk populations. While it is too early to draw any conclusions around patient adherence with these recommendations, longer-term tracking of patient cohorts (especially for patients with chronic illnesses) is suggested to document long-term patient adherence to these recommendations and subsequent impact on quality metrics. It can be expected that clinics would eventually experience sustained effects and better value in health care—particularly around improvements in clinical efficiency, patient care, and patient quality metrics (e.g., compliance with recommended labs or office visits)—as the platform continues to be utilized to its full potential.