

Improving Patient Access to Outpatient Cardiology Services: Three Approaches

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Abstract

Improving patient access is an essential function of any healthcare provider organization that seeks to promote the timely use of health services to achieve an optimal outcome for patients. Patient access has taken on a greater public health relevance throughout the COVID-19 pandemic as patients delayed seeking care, elective surgical procedures were suspended, and a national healthcare labor shortage ravaged provider organizations' abilities to sustain operations. From May to November of 2023, during my Administrative Residency with the executive leadership team at the University of Pittsburgh Medical Center (UPMC) Heart and Vascular Institute (HVI), I had the opportunity to play an active role in the health system's push to promote patient access. As a Resident, I contributed to three projects which supported the UPMC Health Services Division's patient access initiative. These three projects sought to address geographic access barriers for UPMC HVI patients in southwestern Pennsylvania, analyze call center operations to improve patient scheduling, and develop a strategic talent pipeline for cardiac imaging through the optimization of clinical rotation placements.

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1.0 Introduction: Patient Access and the UPMC Heart and Vascular Institute

The Agency for Healthcare Research and Quality (AHRQ) defines patient access as “the timely use of personal health services to achieve the best health outcomes” (AHRQ, n.d.) According to AHRQ, patient access has four key components: coverage (insurance), services (usual source of care), timeliness, and workforce (AHRQ, n.d.). Additional factors that influence patients’ ability to access care include bias within the medical community, work-related barriers, geographic location, and communication barriers (Wolters Kluwer, 2022). Improving access to healthcare services is a major priority of the U.S. Department of Health and Human Services as outlined in the Healthy People 2030 report (HHS, 2020). National efforts to improve access to healthcare services have shown some signs of improvement in recent years as the percentage of people reporting that they cannot get medical care when they need it dropped from 8.5% in 2019 to 7.0% in 2021 (HHS, n.d.). Despite the signs of improvement, these figures do not account for the impact that the COVID-19 pandemic had on the ability of healthcare organizations and the healthcare workforce to ensure that patients can access care in a timely fashion.

The COVID-19 pandemic rapidly changed the healthcare landscape for patients, providers, and insurers. Hospitals had to navigate huge surges in ICU capacity, suspensions of elective procedures, and decreased outpatient specialty and primary care volumes (Cole, 2021). Simultaneously, an economic crisis caused millions of Americans to lose their employer-sponsored health insurance (Cole, 2021). These challenges were exacerbated by the fact that the U.S. has a fragmented healthcare delivery system where gaps in accessibility have persisted for years.

Additionally, the COVID-19 pandemic pushed the healthcare workforce dangerously close

to a breaking point. During the height of the pandemic, up to 30% of healthcare workers considered leaving the workforce, and almost 60% said that they experienced impacts on their mental health (AHA, 2021). These figures are especially alarming considering that prior to the COVID-19 pandemic, the U.S. was already projected to experience a shortage of healthcare workers with estimates projecting shortages of hundreds of thousands to millions.

Health systems, big and small, independent provider organizations, insurers, and government entities will all play a role in generating solutions to improve access to care. I had the opportunity to play my part in solving these challenges during my Administrative Residency with the Heart and Vascular Institute (HVI) at the University of Pittsburgh Medical Center (UPMC). The UPMC HVI is an integrated academic cardiovascular service line that includes multiple cardiology subspecialties, cardiac surgery, and vascular surgery. The UPMC HVI has 70+ clinical locations which cover service areas in Central and Western Pennsylvania, Western Maryland, and Western New York.

During my time at the HVI, the executive leadership team of UPMC's Health Services Division mobilized leadership teams from across the health system in an all-hands-on-deck effort to improve patient access. This patient access initiative would dominate my residency experience because the HVI's vice president, who was also one of my residency preceptors, was tasked with leading this initiative for the Health Services Division. Subsequently, I was afforded the opportunity to be a direct contributor to this initiative through the UPMC HVI. The following executive summaries will highlight three unique projects that I worked on throughout my Administrative Residency. Broadly speaking, these projects focused on geographic access barriers, call center performance monitoring, and stabilizing the cardiac imaging workforce.

1.1 Project One

1.1.1 Problem Statement

The UPMC HVI currently lacks a significant outpatient presence for adult and pediatric cardiology outside the south suburbs of Pittsburgh, PA. This region's lack of an outpatient clinic creates a geographic access barrier for established and potential new patients residing in this region.

1.1.2 Purpose Statement

This strategic analysis of the UPMC HVI's outpatient services in Southwestern PA will focus on areas beyond the south suburbs of Pittsburgh. Specifically, the analysis will look to identify opportunities for expansion of the service line's outpatient presence in the following counties: Allegheny, Fayette, Greene, and Washington, as well as portions of Westmoreland County. At the conclusion of this project, UPMC HVI leadership will have a thorough assessment of the current state of the service line's outpatient presence in the defined region including gaps in coverage, identification of major competitors, and specific location recommendations for an outpatient clinic location.

1.1.3 Introduction and Background

In the spring of 2022, UPMC's marketing intelligence team performed a preliminary analysis of adult and pediatric cardiology procedural visits over a 5-year period revealing that the

UPMC HVI had experienced consistent patient volume loss to multiple competitors who are situated in areas surrounding suburban Pittsburgh to the south and east. Members of the UPMC HVI executive leadership team hypothesized that these volume losses were driven by a lack of outpatient locations in these regions thus creating a geographic barrier for established and potential new patients to access cardiovascular services through the UPMC HVI. It has been well-established that geographic barriers disrupt the continuity of care by causing patients to miss appointments and by creating medication non-adherence (Syed et al., 2013). This is particularly alarming for cardiology patients as geographic barriers related to transportation have been associated with increased mortality for patients who had experienced acute coronary syndrome (Erskine et al., 2018). The findings of the initial analysis and implications regarding access and quality generated significant interest from the UPMC HVI executive leadership team to explore the issue further.

The exploration of expansion opportunities in the outpatient setting is also a key business priority for many health systems in the changing healthcare landscape. Recent research from Huron Consulting Group reveals that 44% of health executives believe that outpatient care will be a major growth area (Huron Consulting Group, 2019). At the same time, 50% of health executives report that their organization does not have an outpatient growth strategy in place (Huron Consulting Group, 2019). This project provided an opportunity for me to directly support the UPMC HVI executive leadership team in crafting a strategy for a high-growth line of business for the service line.

1.1.4 Methods

To complete the strategic analysis of the UPMC HVI's outpatient presence in Southwestern

PA our team had to leverage findings from previous analyses, internal data, and external data. The internal data that was needed to complete the analysis included existing UPMC HVI outpatient clinic locations, adult and pediatric clinic volumes, and patient ZIP codes. We obtained historical data from ~18,000 outpatient visits from Q3 2020 to Q2 2022 through UPMC's internal clinical analytics tools. Data were obtained from the following three UPMC HVI clinics: Bridgeville, CHP Washington, and South Hills. These clinics were specifically chosen because they are nearest to our previously defined area of focus. The only external data we utilized was the location of outpatient clinics for the UPMC HVI's major competitor in the southern region, the WVU Medicine HVI. This information was available on WVU Medicine's website.

This data provided us with all the information needed to complete the following deliverables. All analyses were done in Power BI utilizing the ArcGIS application. First, we began by mapping the locations of the existing UPMC HVI and WVU Medicine HVI clinics. Once clinics had been mapped, we performed a 30-minute drive time analysis for the following UPMC HVI clinic locations to assess total geographic coverage: Latrobe, Somerset, Washington, White Oak, and Western Maryland. I was then tasked with using internal patient data to create heat maps of adult and pediatric patient populations for UPMC HVI clinics of interest at Bridgeville, South Hills, and CHP Washington. The heat map of the existing patient population was then overlaid with the map of clinic locations and a 30-minute drive time radius for each clinic. Other deliverables included mapping a 30-minute drive time radius from our proposed new clinic location, SWOT analysis of our recommendation, and a slide deck highlighting our findings which was presented to UPMC HVI executive leadership.

1.1.5 Results and Discussion

Our first objective was to establish the extent to which the WVU Medicine HVI had encroached into Southwestern PA. Once we mapped existing UPMC HVI and WVU Medicine HVI clinic locations, we identified a potential opportunity area (highlighted in orange) to explore further (Figure 1). This potential opportunity area encompasses an area of Southwestern PA including the towns of Belle Vernon, California, Connellsville, Uniontown, and Waynesburg. A 30-minute drive time radius from several UPMC HVI clinics surrounding this region gave further support to our initial opportunity area finding as a clear UPMC HVI coverage gap was visualized (Figure 2). The northernmost WVU Medicine HVI clinic is in Monongahela, PA, and this location lies within the 30-minute drive time radius of several UPMC clinics (Figure 2).

The next step in our analysis was to map the existing adult and pediatric patient populations for the UPMC HVI Bridgeville, South Hills, and CHP Washington clinics. The adult patient population map revealed a high patient density living in Pittsburgh's southern suburbs and isolated pockets of high patient densities in California, PA, and Uniontown, PA (Figure 3). The highest patient density area outside of urban and suburban Pittsburgh was Washington, PA (Figure 3). The map of pediatric patient density revealed similar findings to the map of adult patients, but with two notable exceptions. Unlike the adult patient population, no significant pediatric patient population appeared in California, PA, but there was a higher density of pediatric patients in the Waynesburg, PA area (Figure 4).

Overlaying the 30-minute drive time map onto the ZIP code patient density map helped to visualize the geographic coverage gap that established patients were facing (Figure 5). A trio of WVU Medicine HVI clinics surrounds this area to form a triangle. This triangle is centered around California, PA, and is anchored by clinic locations in Waynesburg to the southwest, Uniontown to

the southeast, and Monongahela to the north (Figure 5). We then added a hypothetical UPMC HVI clinic location in California with a 30-minute drive time radius to assess the coverage this location provides to the isolated patient populations facing longer driving distances to access cardiovascular care through the UPMC HVI (Figure 6).

1.1.6 Recommendations

After thoroughly reviewing the findings of the analysis our team officially presented the results to the UPMC HVI executive leadership team. We identified California, PA as the most suitable location for a potential new UPMC HVI outpatient location in the region extending beyond Pittsburgh's south suburbs. In addition to our maps that visualized existing patient population densities, existing clinic locations, and drive times, we also presented a SWOT analysis of the California, PA location to further contextualize our recommendation (Figure 7). The UPMC HVI executive leadership ultimately accepted the findings of our analysis which were then forwarded to UPMC's corporate real estate team for further review.

Overall, this project was successful at assessing the current state of the UPMC HVI's outpatient presence in the region extending beyond Pittsburgh's south suburbs and it successfully identified a specific location to target for a potential new clinic. The methodologies that we employed can be very useful to create a starting point for more in-depth analysis, but ultimately do not tell the whole story due to limited data sources and analytic capabilities. For future analyses, I would recommend that they are done in conjunction with UPMC's marketing intelligence team to obtain a more comprehensive assessment of the market in question. This approach would allow for expanded data capabilities stemming from broader data sources and more advanced analytics.

1.1.7 Competency Development

My participation in this project allowed me to strengthen the Pitt MHA competencies of analytical thinking, communication, and strategic orientation. My analytical thinking was strengthened by considering the problem at hand and then identifying what data we already had, what data we would need to obtain, what data tools we would use, and identifying the most effective way to visualize data. Utilizing data tools such as Power BI and ArcGIS massively improved my data analysis and data visualization skills. Strategic orientation was strengthened by understanding the implications this project had for the service line's outpatient growth strategy which is aimed at improving geographic coverage for existing patients. Lastly, this project strengthened my communication skills by providing regular project updates to leadership and presenting findings to the executive leadership team. The regular project meetings and final presentations of the project's findings helped me develop an executive presence that I continue to build upon.

1.2 Project Two

1.2.1 Problem Statement

The UPMC HVI currently lacks a comprehensive method for evaluating the performance of outpatient office visit scheduling. Without the ability to assess the outpatient office visit scheduling process, UPMC HVI executive leadership lacks sufficient information to drive

decision-making regarding optimization efforts to enhance patient access in the outpatient setting by reducing the burden of office visit scheduling.

1.2.2 Purpose Statement

This project sought to assess and improve the current state of performance monitoring for scheduling processes used by the UPMC HVI for outpatient office visits. The project is focused on evaluating the UPMC HVI's largest outpatient scheduling pathway, the virtual call center (VCC). The major deliverable of this project is a business intelligence tool that UPMC HVI executive leadership can use to evaluate key performance indicators (KPIs) for the VCC. Insights from the business intelligence tool will lead to enhanced data-driven decisions by the UPMC HVI executive leadership team to identify additional areas of process improvement impacting patient access including provider template optimization.

1.2.3 Introduction and Background

In response to UPMC's system-wide patient access initiative, the executive leadership team of the UPMC HVI began evaluating the current state of outpatient access within the service line. This evaluation led to a decision to create a standalone UPMC HVI virtual call center (VCC). The VCC quickly became the highest volume access pathway for patients trying to obtain outpatient cardiovascular services through the UPMC HVI. The creation of the VCC necessitated the creation of a VCC performance management plan for UPMC HVI executive leadership to assess the call center's ability to enhance the scheduling process for outpatient office visits. When I began my

Administrative Residency in May 2022, managers of the VCC only had access to select call center metrics provided by UPMC's corporate scheduling service.

The lack of a comprehensive performance monitoring system for the call center created several issues for the UPMC HVI executive leadership team. First, a non-existent performance monitoring system means that executive and operational leadership do not have adequate means to analyze the overall operational performance of the VCC. Second, incomplete information created barriers to performing root cause analysis into specific problem areas to uncover underlying inefficiencies in scheduling processes. Finally, KPIs and associated benchmarks are not integrated into one platform to be tracked month over month to assess improvement efforts.

Performance monitoring and call center optimization are critical factors in the UPMC HVI's efforts to successfully achieve patient access improvements that UPMC system leadership is aspiring to achieve. This is underscored by a 2021 report from the Association of American Medical Colleges (AAMC) and healthcare performance improvement giant, Vizient, which identified actionable data analytics as a primary driver of optimized ambulatory access in academic medicine (AAMC & Vizient, 2021). The same report also notes that standardized metrics and benchmarking of data are secondary drivers to optimized ambulatory access. (AAMC & Vizient, 2021). The importance of establishing KPIs and benchmarking call center data is further supported by a 2019 study within the Veterans Health Administration which demonstrated that decreased average speed to answer (ASA) is associated with improved perceptions of urgent care access without accompanying decreases in scheduling lag times (Griffith et al., 2019).

VCC performance monitoring will also align with the UPMC HVI's concurrent effort to optimize outpatient provider scheduling templates. Efforts to optimize and standardize outpatient provider templates have proven potential to increase patient access through the creation of more

appointment blocks (Volk et al., 2019). By utilizing customer relation management (CRM) data from the VCC, the performance monitoring system will be able to inform operational leaders of the successful creation of additional capacity for outpatient appointments.

1.2.4 Methods

As stated in the purpose statement section, the major deliverable of this project is a business intelligence tool that will empower the UPMC HVI executive leadership team to make data-driven decisions regarding outpatient scheduling optimization. To accomplish this goal, the UPMC HVI's Director of Analytics and Quality (Director) and I collaborated with operational leaders to identify relevant data sources and KPIs. Once data was identified and obtained, the Director and I worked to clean data and build an interactive dashboard in Power BI. We were instructed to create a beta version of the dashboard to be presented to operational leaders to receive feedback. Their feedback was then incorporated into a second version of the dashboard that would go on to be presented to UPMC HVI executive leadership.

1.2.5 Results and Discussion

Our first goal was to identify existing data sources relating to the operational performance of the VCC. After interviewing HVI managers with oversight of VCC operations we successfully identified two data sources that would feed into our initial dashboard. The first data source was an automated monthly report of VCC operational metrics for cardiology and cardiac surgery. Cardiology and cardiac surgery reports were generated separately but reported the exact same metrics. The second data source was an automated monthly report of CRM data for the entire VCC.

The CRM report included data that would be used to evaluate individual practices on their scheduling processes. While patients reached the HVI by calling the central VCC, the responsibility of resolving CRMs falls on individual practices.

With our data sources identified, we could then turn our attention to establishing KPIs that the dashboard would track month after month. We knew that our selected KPIs would need to showcase the overall operational performance of the VCC while simultaneously allowing operational leaders to access more granular data showcasing the drivers of CRM generation. After assessing what information was available from our data sources and interviewing VCC managers we decided on the KPIs to include for VCC operational performance and CRM generation. Table 1 offers a detailed explanation of the selected KPIs and their categorization (Table 1).

Following the establishment of the KPIs, the Director and I began constructing the HVI VCC and CRM dashboard in Power BI. Figure 8 shows the initial landing page that users see when they open the dashboard in Power BI (Figure 8). This initial landing page provides an overview of CRM generation for the entire service line. Users can see month-over-month changes for total CRMs, average days to resolve CRMs, % of CRMs escalated, total CRMs by practice, and top 5 reasons for CRM generation. The CRM dashboard is highly interactive and offers several ways in which data can be filtered. Since CRMs are resolved by individual practices it was very important for us to create an easy way to filter the CRM data by practice. Figure 9 shows how the dashboard can be filtered to a specific practice using the “Department” slicer at the top of the dashboard (Figure 9). All graphics in the dashboard automatically refresh to display the relevant data for that practice only. This feature is very useful for users of the dashboard to identify practices that are either performing very well or very poorly regarding CRM generation and resolution. Figure 10 highlights how the CRM dashboard allows users to drill down to more in-depth CRM data to view

specific reasons for CRM generation (Figure 10). The most important information that this view provides is tracking how many CRMs are generated due to “No Availability for Physician or Site/No Correct Openings”. This metric is very useful to gauge the success of outpatient provider template optimization efforts given that template optimization directly correlates to the creation of additional appointments.

On a separate tab of the dashboard, users can view KPIs used to assess overall VCC operational performance (Figure 11). Due to limitations with the available VCC data, this portion of the dashboard is not very interactive or filterable. Individual call center agent performance is not being tracked by this dashboard at this time because that data is already measured separately. Despite the limitations, users can still view the month-over-month performance of the VCC for cardiology and cardiac surgery.

1.2.6 Recommendations

The final version of the dashboard was presented to UPMC HVI executive leadership by the Director and me where we recommended its adoption as the service line’s central performance monitoring system for the HVI VCC. Following our presentation and demo UPMC HVI executive leadership accepted the dashboard for use. This result signaled that our efforts were successful in creating a performance monitoring system for the newly created HVI VCC. Looking ahead, streamlining the dashboard update process can be accomplished by utilizing the features of Microsoft’s Power Automate app, which can execute regularly scheduled dashboard updates. Finally, in an effort to drive actionable insights, data clarity was improved by reducing the CRM topic list from 52 topics/subtopics to 14 topics/subtopics.

1.2.7 Competency Development

This project required me to demonstrate and enhance the Pitt MHA competencies of analytical thinking, information technology management, and performance measurement and process management. My analytical thinking was developed by interviewing managers of the HVI VCC to understand VCC functions, identifying available data, and establishing KPIs. The creation of the dashboard itself contributed to the development of my information technology management because it required a great deal of hands-on work with a business intelligence software that I was previously not familiar with, and presented an opportunity to leverage technology resources to improve operations. Lastly, my performance measurement and process management competencies were developed by learning the business processes of the HVI VCC, identifying KPIs to gauge performance, and leveraging data to drive operational decision-making.

1.3 Project Three

1.3.1 Problem Statement

In the midst of COVID-19 pandemic-related stressors on the healthcare workforce, the UPMC HVI began experiencing high vacancy rates for cardiac imaging professionals including echocardiography sonographers and invasive cardiac technologists. Prolonged shortages of these staff members have led to backlogs of patients who experience delays in accessing cardiac imaging services at UPMC hospitals.

1.3.2 Purpose Statement

To address the ongoing staffing challenges impacting cardiac imaging services, UPMC HVI executive leadership assembled a multi-disciplinary workgroup in an all-hands-on-deck effort to evaluate and improve the situation. The work group was given the initial directive to assess the current state of the cardiac imaging workforce in all regions in the service line. The workgroup consisted of administrative, operational, and clinical leaders from across the service line who will work in unison to formulate viable strategies for immediate and long-term improvements in staff recruitment, development, and retention.

1.3.3 Introduction and Background

Cardiac imaging professionals use specialized equipment to obtain images of heart structures including chambers, muscles, and vasculature. These professionals historically performed invasive procedures in cardiac catheterization labs, but technological advances have led to the growth of non-invasive techniques to obtain similar images of the heart (Blankstein, 2012). The U.S. Bureau of Labor Statistics (BLS), projects job growth of 10% and 14,700 new jobs for diagnostic medical sonographers and cardiovascular technologists between 2021-2031 (U.S. Bureau of Labor Statistics, 2022). This growing demand for cardiac imaging professionals is largely driven by the rising prevalence of cardiovascular disease seen in the American population. Despite this growing demand, health systems across the country face stiff competition to hire and retain cardiac imaging professionals.

Cardiac imaging services were not immune to the impacts that the COVID-19 pandemic has had on the healthcare workforce. Challenges such as burnout, low morale, and competition

from staffing agencies have contributed to healthcare workforce instability (Johnson, 2022). The UPMC HVI has felt the effects of these challenges on its cardiac imaging workforce. The resulting staffing shortage has led the UPMC HVI executive leadership team to weigh the options of consolidating cardiac imaging services to fewer locations or suspending operations at locations. With a growing backlog of patients and significant long-term continuity of operations challenges, the UPMC HVI executive leadership team quickly assembled administrative, operational, and clinical leaders to develop a suite of strategies aimed at stabilizing staffing levels in the near term and developing long-term strategies for improving the cardiac imaging workforce.

1.3.4 Methods

Due to the enormity of this challenge, experts from multiple disciplines were organized into a workgroup to lead targeted efforts and develop innovative ideas. It was decided that the workgroup would initially focus its efforts on echocardiography sonographers before focusing on invasive cardiac technologists. The overall operational command of this workgroup rested with the UPMC HVI Director of Operations, Cardiology (Director) who would provide regular updates to the UPMC HVI executive leadership team. The Director organized the various administrative, operational, and clinical leaders into committees where their respective subject matter expertise could be leveraged. The committees would be coordinated by a member of the UPMC HVI project management team who would report to the Director. Figure 12 illustrates the command structure and organization of the workgroup (Figure 12).

Each committee would focus on one of the following strategic pillars: finance, human resources, training & education, point of care ultrasound (POCUS), and recruitment. The committees were tasked with assessing the current state of their respective areas of expertise and

generating viable solutions for problem areas. I was tasked with leading the training & education committee along with the Manager of Cardiovascular Services (Manager) at UPMC Passavant. The training & education committee was specifically tasked with developing solutions to stabilize and grow strategic echocardiography talent pipelines into the UPMC HVI via clinical rotation placements.

1.3.5 Results and Discussion

Prior to any of the committees beginning their work, it was imperative that all stakeholders had an up-to-date overview of the breadth of echocardiography staffing levels across the service line. Thus, the first order of business was to quantify echocardiography staffing levels in each service line region. An echocardiography vacancy report was created and distributed to the workgroup and UPMC HVI executive leadership monthly. Figure 13 provides a look at echocardiography shortages across the UPMC HVI (Figure 13). In summary, as of June 2022, there was a shortage of over 71 FTEs across all service line regions with UPMC Harrisburg being impacted particularly hard (Figure 13). This data informed the workgroup as well as HVI executive leadership on where to target immediate efforts.

While other committees began formulating and implementing rapid changes to stabilize echocardiography staffing, the training & education committee set out with a longer-term focus. Our first objectives were to define the current state of the HVI's training & education programs for echocardiography, identify opportunities for improvement, and establish future state goals. Table 2 summarizes the committee's findings from a current state analysis and brainstorming sessions for future state goals (Table 2). In short, the UPMC HVI did not have strong relations with external programs that educate echocardiography sonographers, lacked a standardized

process for placing echo students into clinical rotations within UPMC facilities, and made no deliberate efforts to hire new graduates with prior clinical experience in a UPMC facility. These findings then led the training & education committee to focus on two main objectives. First, rebuild relationships with the local echocardiography programs at Allegheny County Community College, Harrisburg Area Community College, and South Hills School of Business and Technology. Second, optimize the UPMC HVI's process for placing echocardiography students into clinical rotations.

It was decided that the Manager would take the lead on relationship building between the schools and the UPMC HVI while I handled the task of standardizing student placements across the service line. Members of the training & education committee and I met with representatives from UPMC's Office of Advanced Practice Providers (OAPP) to learn how they were able to manage every single APP clinical rotation placement within UPMC. The representatives from OAPP informed us that they used a software platform from an outside vendor called myClinicalExchange to manage the entire clinical rotation placement process. Figure 14 provides an overview of the functionality that myClinicalExchange offers (Figure 14). In addition to the features outlined in Figure 14, myClinicalExchange can maintain rosters of students who have successfully completed clinical rotations in UPMC facilities to aid in recruitment efforts and standardize the student onboarding process across the service line. The most significant thing we learned about myClinicalExchange was that the software is available to UPMC at no cost because 100% of the cost is passed to the participating schools.

Since there was an existing relationship between myClinicalExchange and UPMC we were able to move quickly to arrange several demos of the software for members of the training & education committee. In the demos, we were able to observe both the process of requesting a

student placement and the process of approving the request and placing the student into a clinical rotation. We also learned that the estimated time to configure the software to our needs and complete the implementation would take between 4-6 months. Following these demos, we became confident enough that myClinicalExchange could be a viable solution to accomplish the goal of standardizing echocardiography student placements across the service line. We decided that an initial implementation should be piloted with UPMC HVI clinical locations in Western Pennsylvania to assess the performance of the software as a standardized echocardiography student placement process.

1.3.6 Recommendations

After proposing the idea of a myClinicalExchange implementation to the Director leading the workgroup, I was asked to present it to the UPMC HVI executive leadership team. On behalf of the training & education committee, I formally recommended that the UPMC HVI move forward with the implementation of myClinicalExchange and pilot the software with clinical locations in Western Pennsylvania before expanding to other regions of the service line. Following my presentation, the training & education committee received approval to move forward with the pilot implementation of myClinicalExchange. In the following weeks, I began working with the implementation team at myClinicalExchange to initiate the formal process of configuring and implementing the software in the UPMC HVI. Given the prescribed implementation timeline, I would not be able to see the implementation through to completion and the remainder of the project was handed off to the Manager of Cardiovascular Services at UPMC Passavant.

An additional recommendation that came out of my work with the training & education committee focused on the lack of historical data regarding echocardiography student placements

in the UPMC HVI. Without easily ascertainable data to track echocardiography student placements across the service line, it becomes increasingly difficult to gauge the success of an echocardiography student placement program. Since myClinicalExchange can maintain records of students who were placed into clinical rotations, I would recommend that this data be used to monitor the KPIs outlined in Table 3 (Table 3). This data could also be reconciled periodically with internal HR data to track if students ever ended up being hired at a UPMC facility.

1.3.7 Competency Development

The experience of participating in the workgroup addressing echocardiography staffing shortages allowed me to strengthen the Pitt MHA competencies of communication, human resources management, and professionalism. My communication was improved by regularly leading committee meetings and communicating the goals of a new student placement process to UPMC HVI leadership, local echocardiography schools, and representatives from myClinicalExchange. My human resources management was improved by learning about staff development, onboarding, and recruitment efforts. Lastly, I was required to demonstrate the highest level of professionalism throughout this project as I represented the UPMC HVI to an outside vendor while trying to expand their relationship with UPMC.

1.4 Conclusion

Before beginning my Administrative Residency with the UPMC HVI, I did not appreciate the many factors that influence patient access nor the downstream implications that poor patient

access can have on patients and health services organizations. After working on these three projects, I have been able to gain hands-on experience addressing some of the unique factors that influence patient access while making tangible contributions to one of UPMC's highest-priority strategic initiatives. While some of the work remains to be completed, I am optimistic that these projects will make a tangible impact on the accessibility of care within the UPMC HVI for years to come. As my own professional journey continues, the lessons that I learned while working on these projects will serve me well so long as health systems strive to deliver high-quality care to patients when they need it.

Due to each project's unique nature, I exercised and strengthened a broad range of Pitt MHA competencies. These projects allowed me to develop my analytical and strategic thinking, data analysis skills, human resources management, performance management, and professionalism. Additionally, I was exposed to key issues facing the UPMC HVI regarding the strategic orientation of the service line, workforce shortages, and performance improvement efforts. I would not have been able to benefit from such a well-rounded residency experience if it had not been for the mentorship that I received from my preceptors and other members of the UPMC HVI leadership team. I am eternally grateful that I had the opportunity to interact with senior leaders and contribute at a high level within a highly respected and highly ranked academic cardiovascular service line.

2.0 Figures and Tables

2.1 Figures

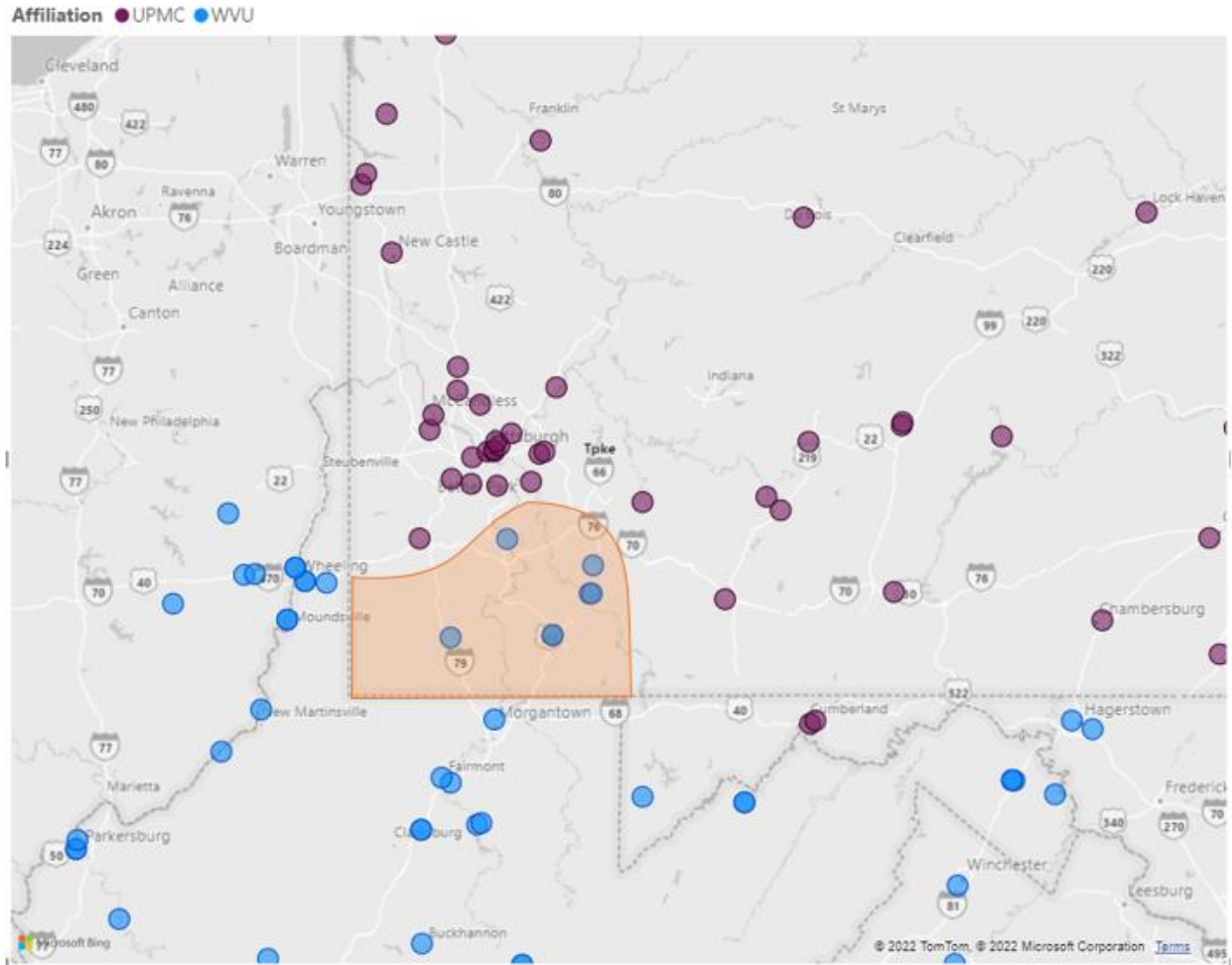


Figure 1. Map of UPMC HVI and WVU Medicine HVI Clinics in SW Pennsylvania

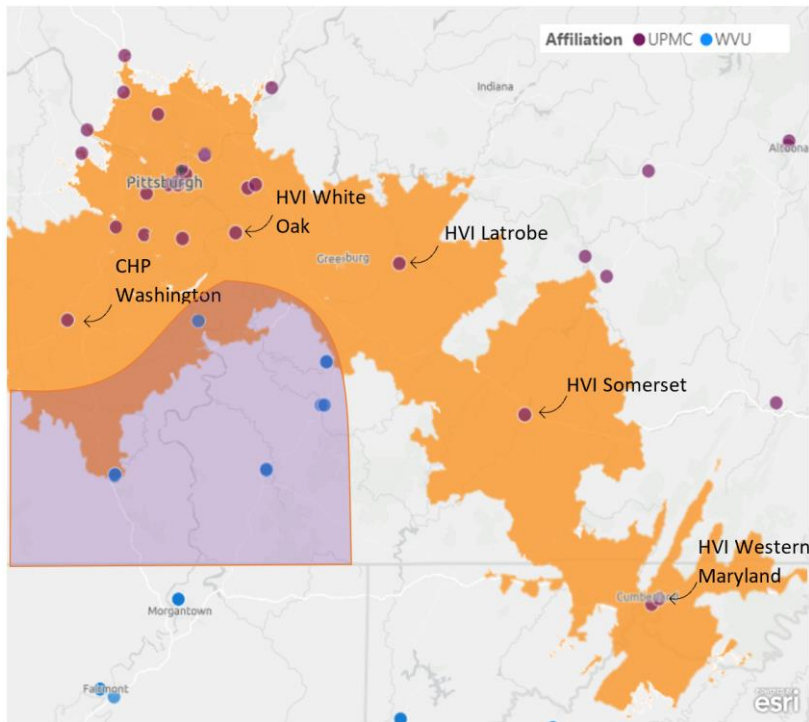


Figure 2. 30-Minute Drive Time Radius from Southernmost UPMC HVI Clinics

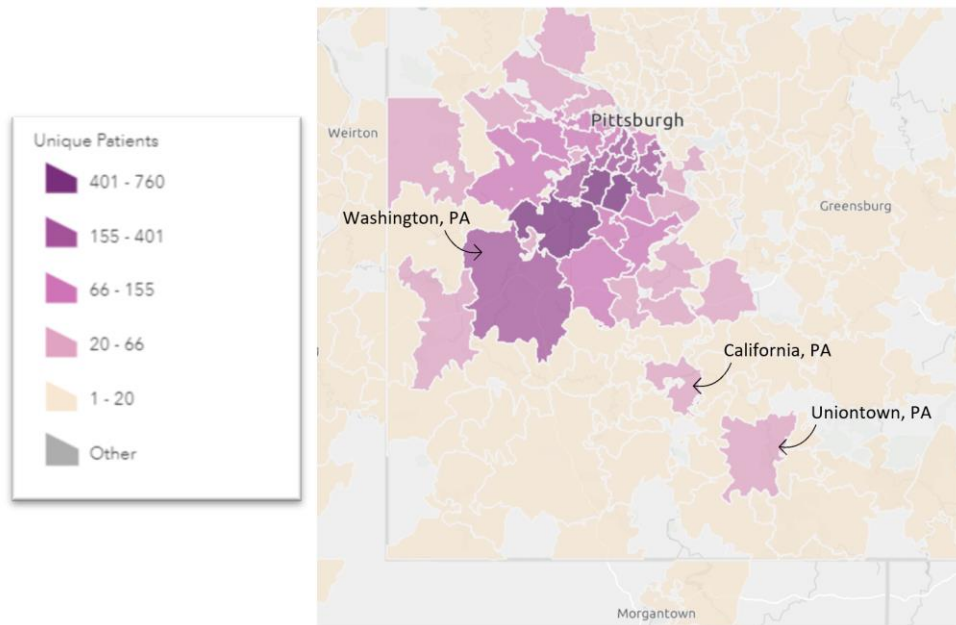


Figure 3. UPMC HVI Bridgeville and South Hills Adults Patient Density by ZIP Code

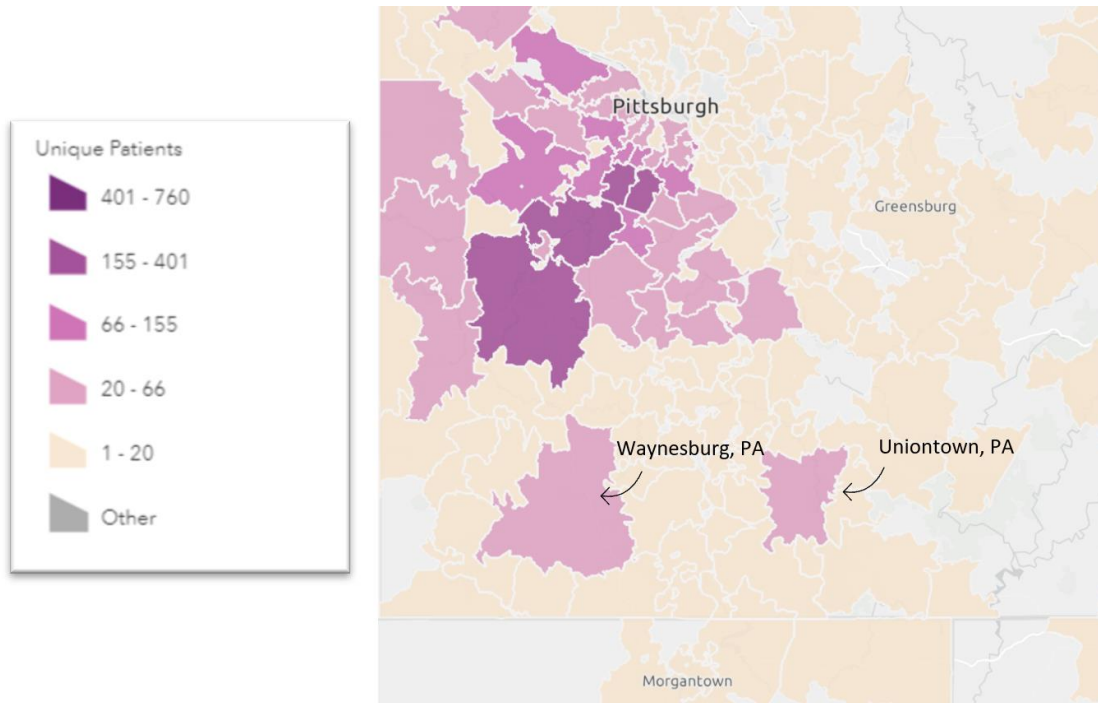


Figure 4. UPMC HVI Bridgeville and Washington Pediatric Patient Density by ZIP Code

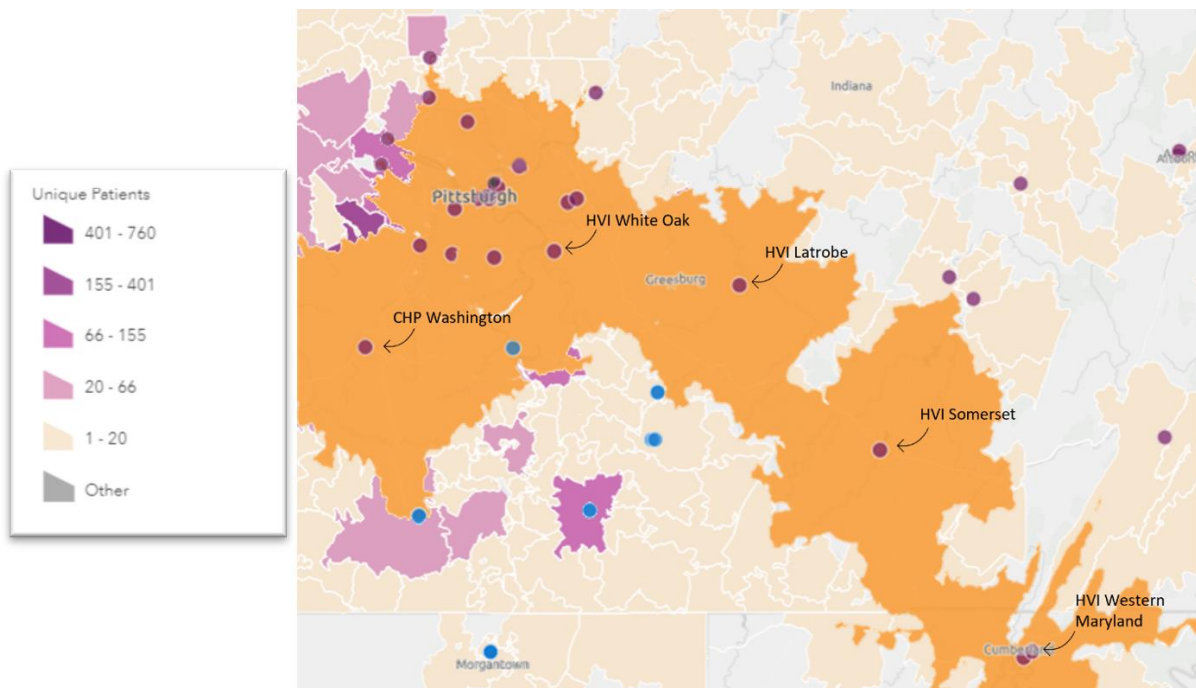


Figure 5. 30-Minute Drive Time Radius Overlay w/ Existing Patient Density Map

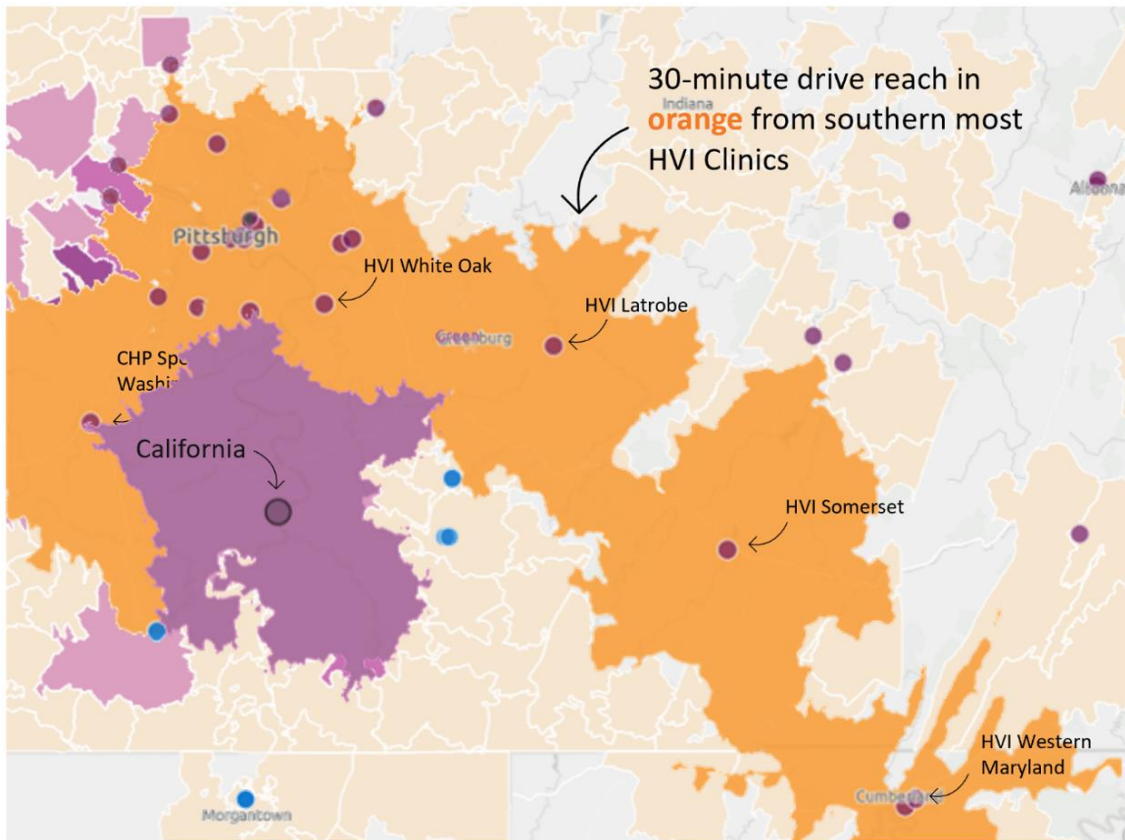


Figure 6. Coverage Created by a Potential New Clinic Location in California, PA

	Positive	Negative
Internal	<p>Strengths</p> <p>Location - closer to existing patients, competes with WVU presence, most densely populated area in Mid-Mon Valley</p> <p>Capabilities - mixed model adult & peds</p> <p>Minimizes geographic access barrier for established patients in the Mon Valley</p>	<p>Weaknesses</p> <p>Closing of nearby clinics occurred in recent years</p> <p>Would likely need both peds & adult volume to make it a viable option</p>
External	<p>Opportunities</p> <p>Expands UPMC HVI geographic coverage to capture new patients</p> <p>Reaches into more affluent areas by Peter's Twp and captures Uniontown market</p> <p>Local college to recruit temp work from</p> <p>Entrenches UPMC HVI front line in SW PA</p>	<p>Threats</p> <p>~40 minute drive to nearest UPMC hospital (McKeesport)</p> <p>~55 minute drive to both UPMC Presbyterian and WVU Ruby Memorial Hospital</p> <p>Local SES and population decline</p> <p>Staffing</p>

Figure 7. SWOT Analysis of a Potential New Clinic in California, PA

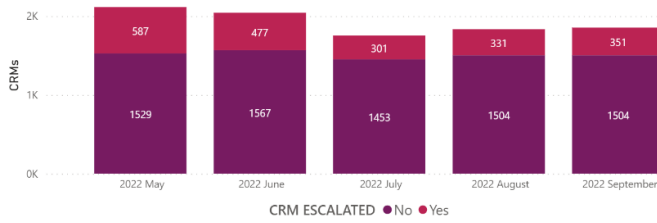
CRM: RESOLUTION, ESCALATION, & REASONS

CRM: BY DEPARTMENT

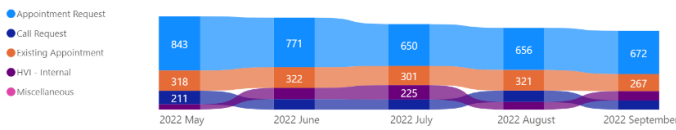
CRM VOLUME & ESCALATION

DRILL DOWN TO CRM DRIVERS →

Year	2022				
	May	June	July	August	September
CRM	2116	2044	1754	1835	1855
CRM MoM Change	2116	-72	-290	81	20
Avg Days to Resolve CRM	1.26	1.46	0.74	0.70	0.81
Avg Days to Resolve CRM MoM Change	1.26	0.20	-0.72	-0.04	0.12
% of CRMs Escalated	28%	23%	17%	18%	19%



TOP 5 REASONS FOR CRM



Year	2022				Total
	June	July	August	September	
PASSAVANT HBC	430	361	408	390	2059
ST. MARGARET	235	207	218	219	1116
PUH	236	197	223	219	1092
MERCY	188	154	170	252	1023
MONROEVILLE	219	211	141	151	948
MAGEE	187	123	116	127	713
SOUTH HILLS/BRIDGEVILLE	150	108	135	113	626
WHITE OAK	57	74	94	72	374
SHADYSIDE GEN CARD	59	87	65	75	343
SHADYSIDE EP	67	57	85	53	329
HVI LATROBE/GREENSBURG OFFICE	54	57	40	58	263
NORTH HILLS/WEXFORD	37	13	22	23	143
HVI WEST MIFFLIN OFC	24	31	29	28	136
HVI GREENVILLE HORIZON OFC	35	21	29	21	131
HRZN SHENANGO	26	14	32	18	109
POWER FOX CHAPEL/SHADYSIDE	21	25	19	14	102
PUH NUCLEAR CARD	6	4	4	12	36
MRI PUH	5	4		2	24
ECHO PUH	5	3	3	5	19
JAMESON	3	3	2	3	18
Total	2044	1754	1835	1855	9604

Figure 8. UPMC HVI VCC and CRM Dashboard Landing Page

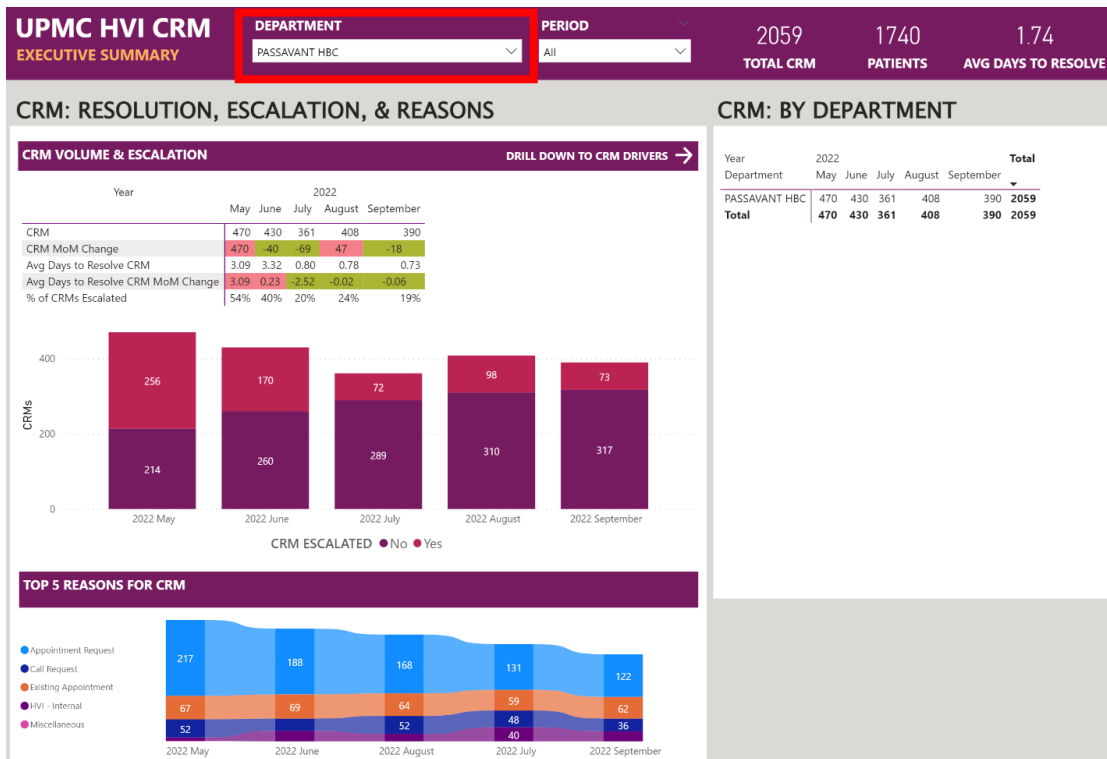


Figure 9. CRM Dashboard Filtered by Practice

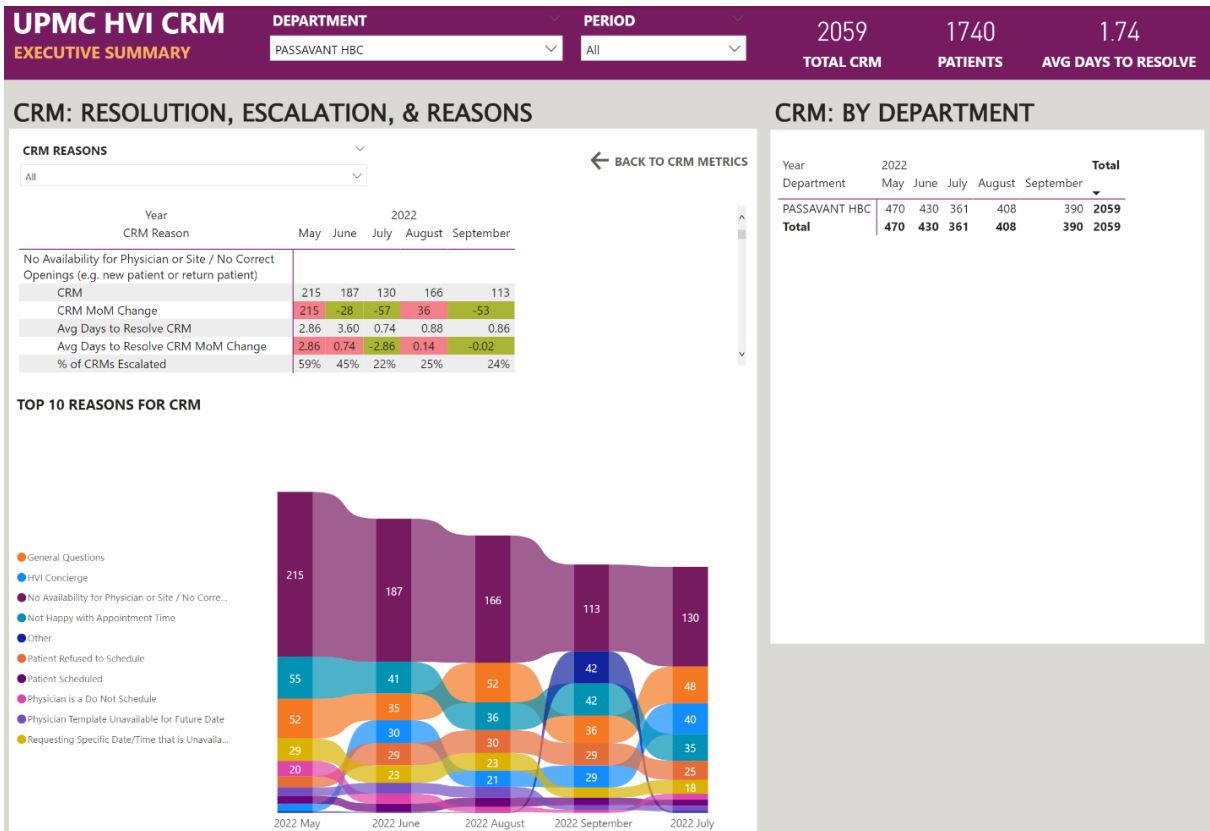


Figure 10. Drill-Down View of CRM Drivers

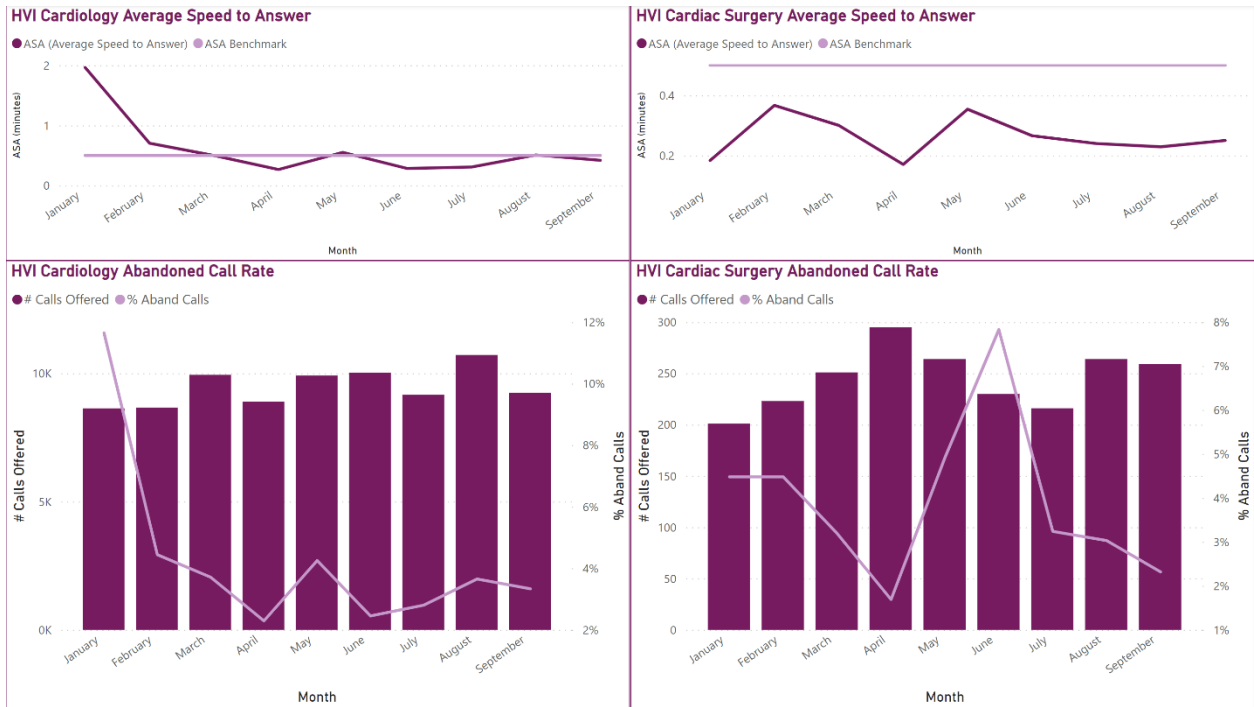


Figure 11. UPMC HVI VCC Dashboard

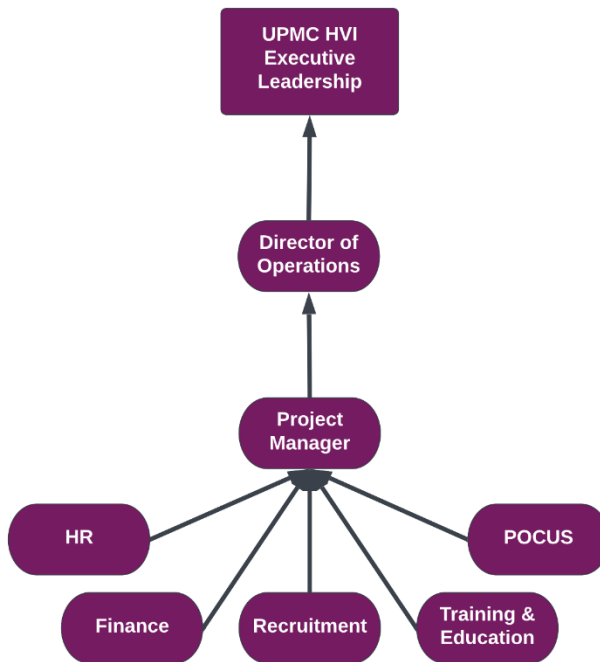


Figure 12. Operational Command of the Workgroup

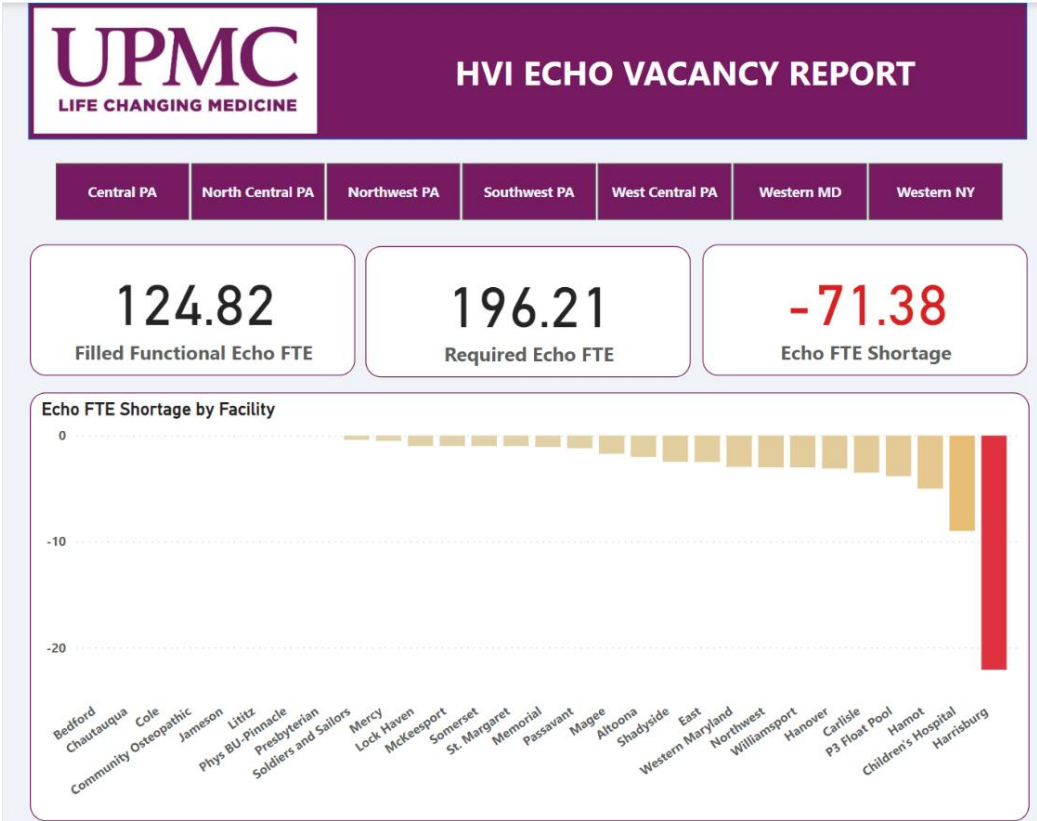


Figure 13. UPMC HVI Echocardiography Vacancy Report as of June 2022



Figure 14. Functions and Features of myClinicalExchange

2.2 Tables

Table 1. VCC and CRM KPI Descriptions

VCC	
KPI	Description
Calls Offered	Total Calls fielded in a given month
Abandoned Call %	% of calls that were not answered
Average Speed to Answers (ASA)	Average duration to field a call from the time it was offered (reported in seconds)
CRM	
KPI	Description
Total CRMs	Total CRMs generated in a given month
Average Days to Resolve	Average duration for a practice to resolve a CRM (reported in days)
CRM Escalation	CRMs that were not resolved within 24 hours (reported as Yes, CRM was escalated or No, CRM was not escalated)
Top 5 Reasons for CRM Generation	The 5 most common reasons that CRMs were generated

Table 2. Current and Future State Goals for Echocardiography Training and Education

Current State	Future State Goals
Weak relations w/ local echo programs	Strong pipeline into clinical rotation from local echo programs
Uncoordinated student placements for echo clinical rotations across the service line	Standardized clinical rotation placement procedures
Decentralized tracking of student placements	Central database of echo students who completed a clinical rotation in a UPMC facility
No formal pathway from clinical rotation to employment with UPMC	Target recruitment efforts to new grads with clinical experience in a UPMC facility

Table 3. KPI Domains for Monitoring Echocardiography Student Placements

KPI Domain	Metrics/Methods
Clinical Rotation Program Growth	Total Successful Clinical Placements YoY Trending of Successful Clinical Placements Total Count of UPMC Sites Hosting Students Total programs Represented in Clinical Rotations
Recruitment	Total Count of Students Hired Immediately Following Graduation YoY Trending of Student Hires
Clinical Rotation Satisfaction	Student Satisfaction Surveys Clinical Rotation Preceptor Surveys Program Director Surveys

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