

FLOW3 Partnered Evaluation Mid-Line Findings (May 2019-January 2020)

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Introduction

The FLOW3 Partnered Evaluation is a collaboration between the FLOW3 Diffusion Team and the VA Collaborative Evaluation Center (VACE).¹ The goal of the partnered evaluation is to evaluate the nationwide expansion of FLOW3 and use real-time data on FLOW3 use and satisfaction at current sites to define implementation and dissemination strategies. The VACE team received startup funding in May 2019, and the evaluation is planned to last through the end of Fiscal Year 2021 (FY21). This report includes the evaluation work completed between May 2019 and January 2020 and outlines the work that is planned over the next year and a half.

The aims of the partnered evaluation are below:

1. To conduct a mixed methods evaluation from the perspective of providers, based on provider satisfaction with the FLOW3 system and with training materials and implementation of FLOW3.
2. To evaluate the impact of FLOW3 on Veteran experience based on satisfaction with the process of receiving a prosthesis and receiving the most appropriate prosthesis to achieve the Veteran's functional goals.
3. To evaluate system level impact of FLOW3 on timeliness of the provision of prosthetic limbs to Veterans, efficiency of the process of ordering a prosthetic limb, cost of the provision of prosthetic limbs, and return on investment of implementing the FLOW3 process.
4. To develop an interactive, web-based implementation toolkit to facilitate national expansion of FLOW3 based on formative evaluation of barriers and facilitators to implementation at Veteran Integrated Service Network (VISN) 22 facilities and Regional Amputation Centers.

FLOW3 Background

FLOW3 is a novel computerized workflow management system that incorporates three custom-designed applications to facilitate the process for obtaining prosthetic limbs for Veterans. The purpose of FLOW3 is to improve timeliness of the provision of prosthetic limbs to Veterans, improve data systems that manage and report on prosthetic limb provision, improve employee satisfaction, and improve the Veteran customer experience. It was developed to address a prosthetic limb care process that was labor and time intensive, inconsistent across facilities, and difficult to coordinate between providers. FLOW3 is comprised of three inter-related computerized applications (prosthetic limb consult template, consult comment tool, and web-based app) that support prosthetic care from prescription, acquisition, fabrication, delivery, and validation. It created a system that made the prosthetic limb process more predictable and consistent, and created a high-quality experience for Veterans.

FLOW3 was initially developed and implemented at the Puget Sound VA Health Care System and VISN 20 (Washington, Oregon, and Idaho). Subsequently, it was selected as a Gold Status Practice in 2017 out of 356 promising practices as part of the VA's Diffusion of Excellence (DOE) program competition. VISN 12 (Illinois and Wisconsin) bid to implement FLOW3 at its eight facilities which resulted in reduced wait time variability from consult to purchase order authorization and more predictable processes with enhanced communication across functional areas, including: decreased timeline of overall process; more efficient processes and time saved for staff; increased transparency for employees and Veterans;

¹ The VA Collaborative Evaluation Center (VACE) is a collaborative multi-center evaluation team that has been conducting national program evaluations since 2011. For more information, please contact Chelsea Leonard (Chelsea.Leonard@va.gov).

and better customer satisfaction experience and improved quality of life for Veterans. Due to its success in VISN 12, FLOW3 was identified jointly by QUERI and DOE as one of the practices that will have a partnered evaluation to support further implementation and expansion to other VISNs and to Regional Amputation Centers (RACs).

Descriptive Summary of Pre-FLOW3 Data

Background

Prior to the implementation of FLOW3, tracking of the provision of prosthetic limbs to Veterans using national data elements was challenging. The full process of limb provision includes multiple steps: 1) an initial prescription; 2) limb specification; 3) ordering; 4) fabrication; and 5) delivery. Prior to FLOW3, tracking the timeliness of these steps was not possible in national data elements. The only consistently measurable time interval was between initial prescription date and order date. Since this was available pre/post FLOW3 implementation, and at sites that never implemented FLOW3, this is the time interval we use in the analyses of FLOW3 effectiveness presented below.

There are also some cost elements available in the data prior to FLOW3 implementation. Using a dataset constructed from CDW raw by operational partner Jeffrey Bott, we have analyzed both timeliness and cost in the pre-FLOW3 data.

Timeliness Using non-FLOW3 Data

We explored the distribution of timeliness in the non-FLOW3 data by summarizing the time interval between initial prescription date and order date across time, facility, and limb type.

As indicated in Figure 1, timeliness of this step was highly variable by facility in the non-FLOW3 data. High-performing facilities had a median of 15-20 days or less, while lower-performing facilities had a median of 30 or more days. The patient level data within facility was highly variable. Only a few facilities showed consistently low times, while most VA facilities exhibited a high degree of variation in their patient level times. Thus, we conclude that even though there are clear high and low performers, the majority of VA sites exhibited unsatisfactory variability in the provision of timely care.

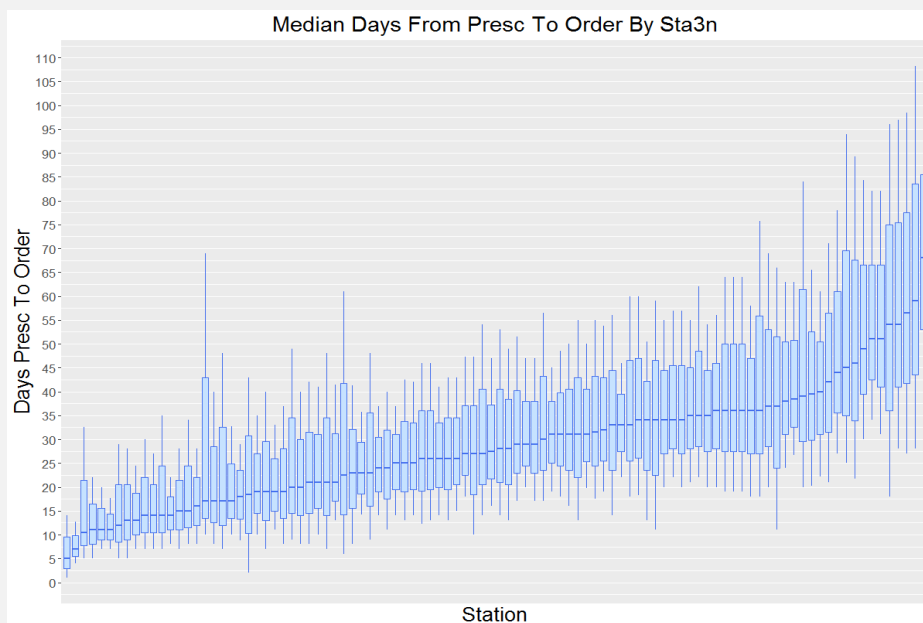


Figure 1. The distribution of timeliness of limb provision as indicated by days from prescription to order date. Each individual boxplot is a single VA site (Sta3n).

We also examined these time intervals across different limb types, including partial foot (part foot), below knee (BK), above knee (AK), other lower, Symes, below elbow (BE), other upper, and above elbow (AE). There was no clear association between limb type and the timeliness of care, as shown in Figure 2.

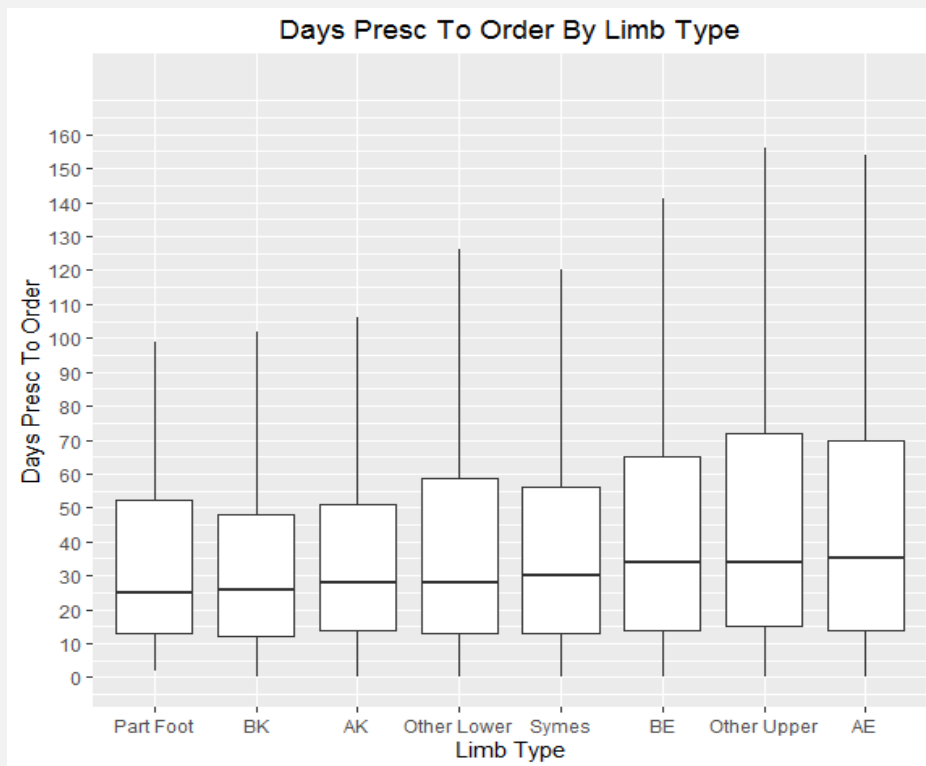


Figure 2. The distribution of timeliness of limb provision as indicated by days from prescription to order date. Each individual boxplot is a single limb type.

Costs of Limb Provision in non-FLOW3 Data

We also examined the costs of limb provision in the non-FLOW3 data. We found high variation in the costs of limb provision, but only small-moderate trends in the cost by site, as shown in Figure 3.

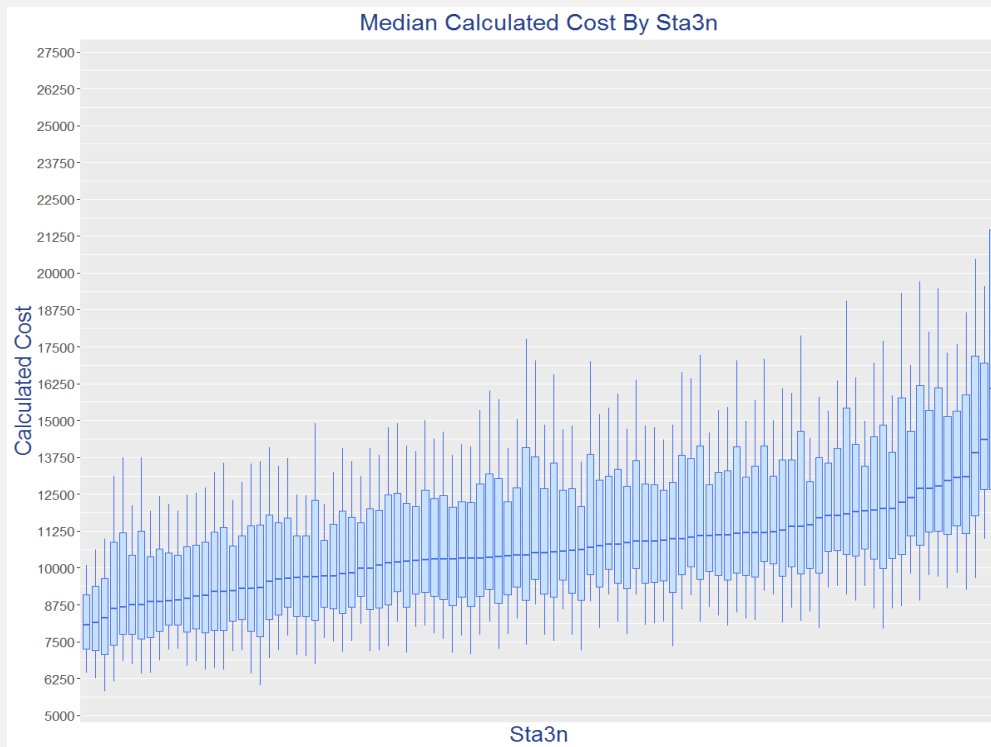


Figure 3. The distribution of calculated cost of limb provision (in dollars). Each individual boxplot is a single site (Sta3n).

We examined the costs by limb type as well. Our operational partners indicated the cost data was oddly distributed for all the limb types except for AK and BK, as shown in Figure 4.

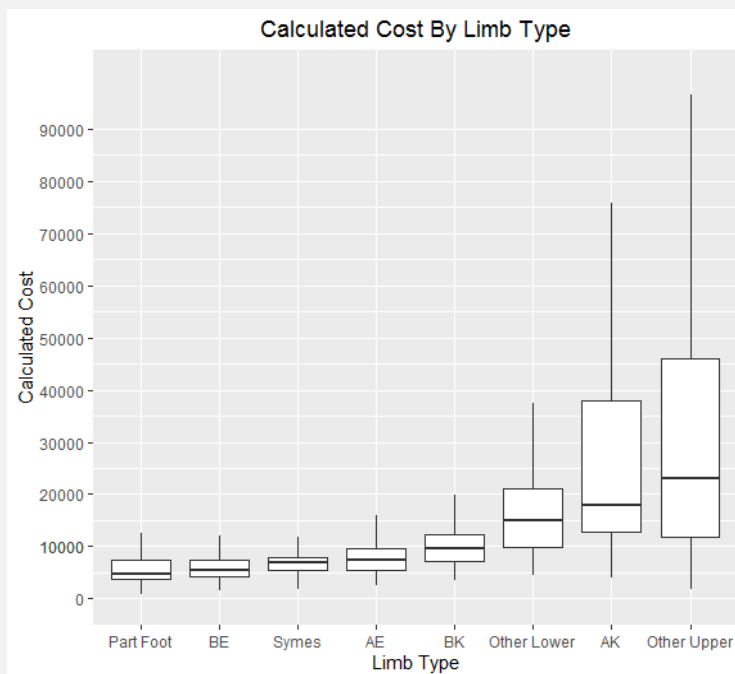


Figure 4. The distribution of calculated cost of limb provision (in dollars). Each individual boxplot is a single limb type.

We also examined the non-FLOW3 data volume by limb type. The majority of the limb types were below knee and above knee, as shown in Figure 5.

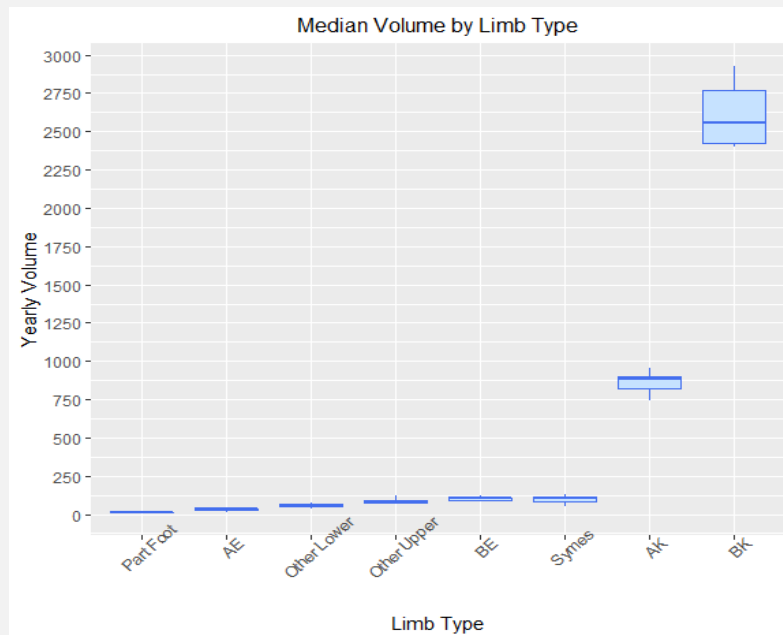


Figure 5. The distribution of volume of limb provision. Each individual boxplot is a single limb type.

Given this, our operational partners indicated the data reliability for the non-FLOW3 data was not good outside of the AK and BK categories. For this reason, we focused the effectiveness analyses below on the subset of Veterans with AK or BK.

Reach

Site Level Reach

FLOW3 was implemented at 24 different VA facilities (as indicated by distinct STA6A designations) during five different waves (designated FLOW3 groups). The timing of the implementation, as well as the group and station identification is presented in the Table 1.

Table 1. Implementation dates for each site and FLOW3 group.

FLOW3 Group	Station	Implementation Date
VISN22	501	4/30/2019
VISN22	600	4/30/2019
VISN22	605	4/30/2019
VISN22	644	4/30/2019
VISN22	649	4/30/2019
VISN22	664	4/30/2019
VISN22	678	4/30/2019
VISN22	691	4/30/2019
VISN12S	537	11/1/2017
VISN12S	550	11/1/2017
VISN12S	556	11/1/2017
VISN12S	578	11/1/2017
VISN12N	585	9/1/2017
VISN12N	607	9/1/2017
VISN12N	676	9/1/2017
VISN12N	695	9/1/2017
RACS	554	4/30/2019
RACS	618	4/30/2019
RACS	640	4/30/2019
RACS	652	4/30/2019
RACS	673	4/30/2019
VISN20	663	6/1/2013
VISN20	663A4	6/1/2013
VISN20	692	1/1/2013

We sought to understand if the facilities where FLOW3 was rolled out to were generally high or low performing facilities with respect to the time from prescription date to order date. The figure below identifies the facilities that were exposed to FLOW3 by name and color. All other VA facilities are indicated with grey boxes. This figure tells us that FLOW3 facilities were not predominately high or low performing facilities prior to FLOW3 implementation. Other than VISN20 (the original FLOW3 development and pilot site), all the FLOW3 groups show a mixture of high and low performing facilities. This is shown in Figure 6.

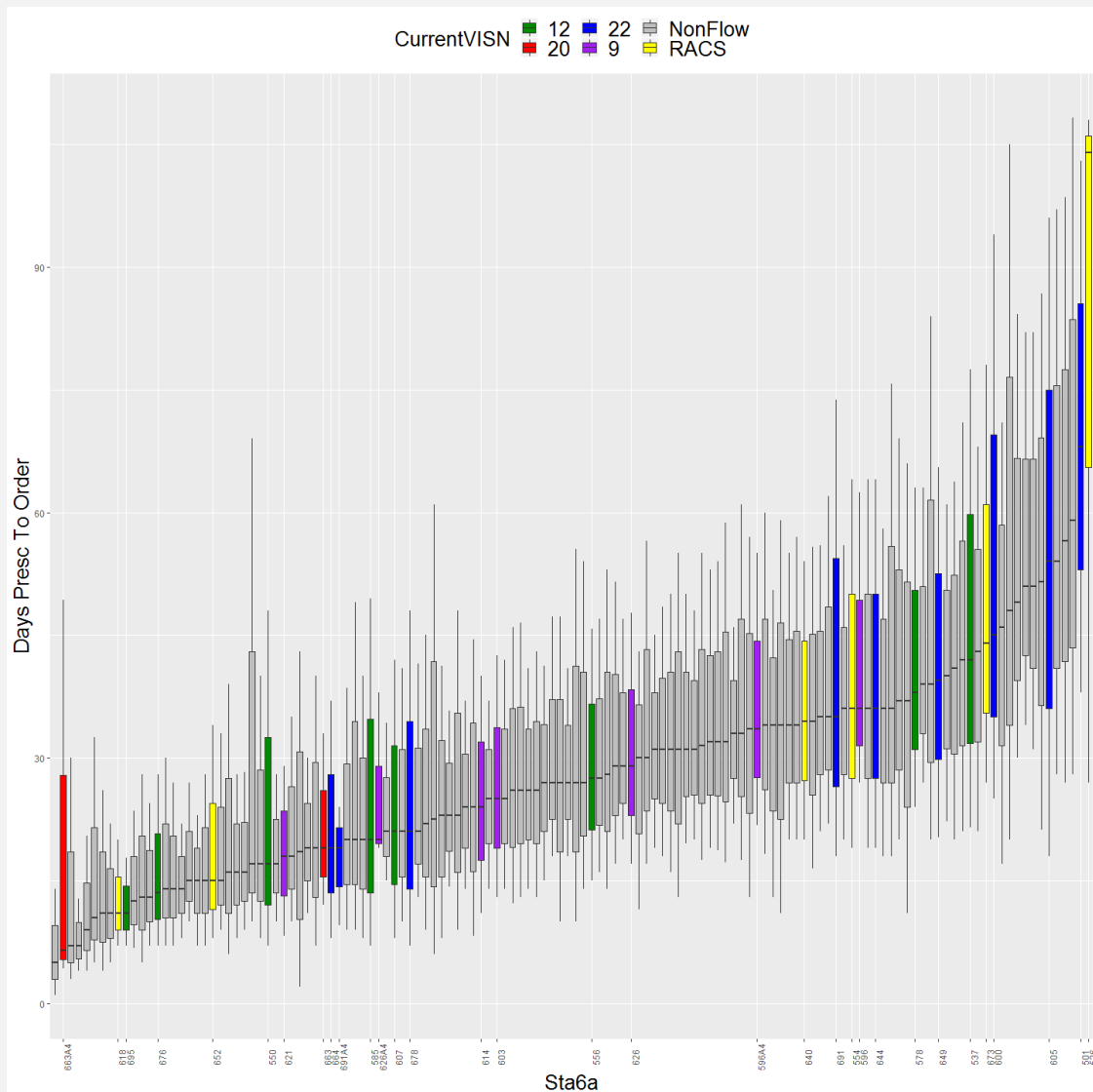


Figure 6. The distribution of site performance in limb provision as indicated by days from prescription to order date. Each individual boxplot is a single VA site (Sta6a).

Veteran Level Reach

To understand reach of FLOW3 implementation at the Veteran level, we identified Veterans who received care at VA facilities following the implementation of FLOW3. We then summarized their demographic information in Table 2. We focused on gender, age, race, ethnicity and geographic characteristics. We estimate that FLOW3 has reached 35,803 Veterans, of which almost 40% are rural.

Table 2. Characteristics of Veterans who were exposed to FLOW3.

Category		Veteran [n (%)]
n		35803
Gender	Female	434 (1.2)
	Male	35369 (98.8)
Age		69.58 (12.33)
Geographic information	Highly Rural	590 (1.6)
	Rural	13584 (37.9)
	Urban	21545 (60.2)
	N/A	84 (0.2)
Race	American Indian	311 (0.9)
	Black	5318 (14.9)
	White	24460 (68.3)
	White Not Hispanic	92 (0.3)
	Asian	112 (0.3)
	Pacific Islander	366 (1.0)
	Unknown Race	5144 (14.4)
Ethnicity	Hispanic Latino	1348 (3.8)
	Unknown Ethnicity	34455 (96.2)

Adoption

Facility Level Adoption

After consultation with our operational partners, we determined that we were able to describe adoption at the facility level using the FLOW3 data elements. Following the installation/implementation of FLOW3, there are four high level documented process steps: prescription date, purchase request date, purchase order date, and delivery date. Post implementation, all care processes should have a prescription date entered by default. However, subsequent dated steps may be missing if staff at a facility do not fully adopt the FLOW3 program. We defined three different adoption states based on conversations with our operational partners, then summarized these states by site:

- Full adoption: all four dates (prescription date, purchase request date, purchase order date, and delivery date) were entered.
- Non-adoption: only the prescription date was entered.
- Start and end adoption: the prescription and delivery dates were entered, but purchase dates were missing.

Figures 7-11 summarize the adoption rates by FLOW3 group and facility. Adoption rates were highly variable across facilities.

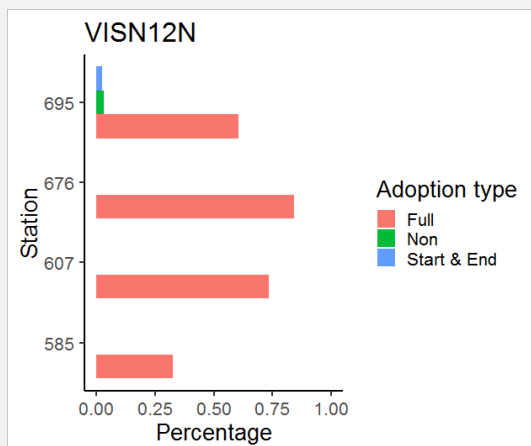


Figure 7. Adoption type and percentage in VISN 12N stations since FLOW3 implementation.

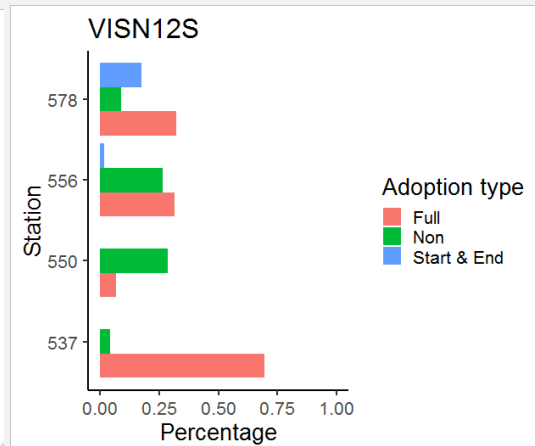


Figure 8. Adoption type and percentage in VISN 12S stations since FLOW3 implementation.

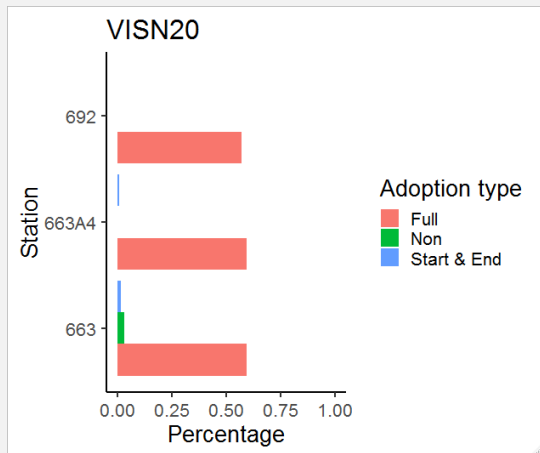


Figure 9. Adoption type and percentage in VISN 20 stations since FLOW3 implementation.

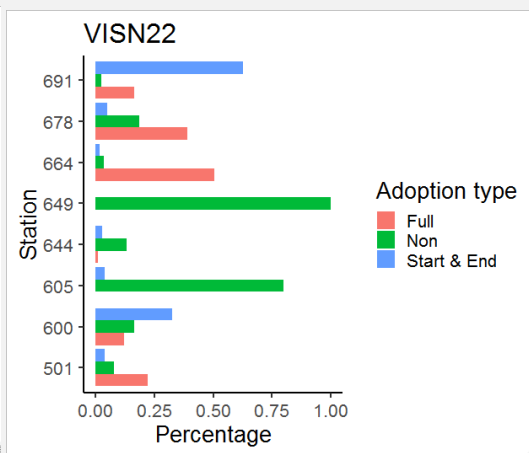


Figure 10. Adoption type and percentage in VISN 22 stations since FLOW3 implementation.

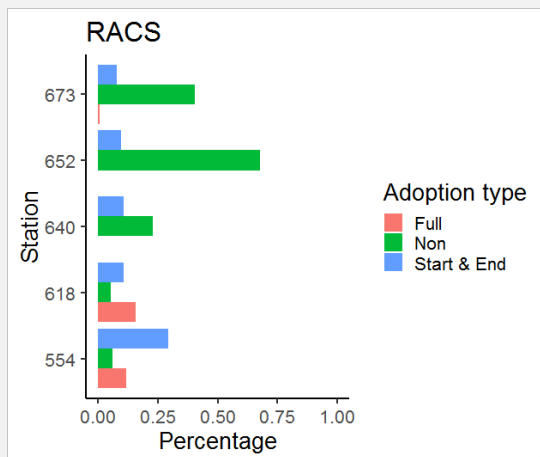


Figure 11. Adoption type and percentage in RACs since FLOW3 implementation.

Figures 12-18 summarize the various definitions of adoption rates across facilities and time. No clear pattern is emerging from these more specific graphs. We will continue to iterate with our operational partners to better understand and identify data driven adoption rates using the FLOW3 data.

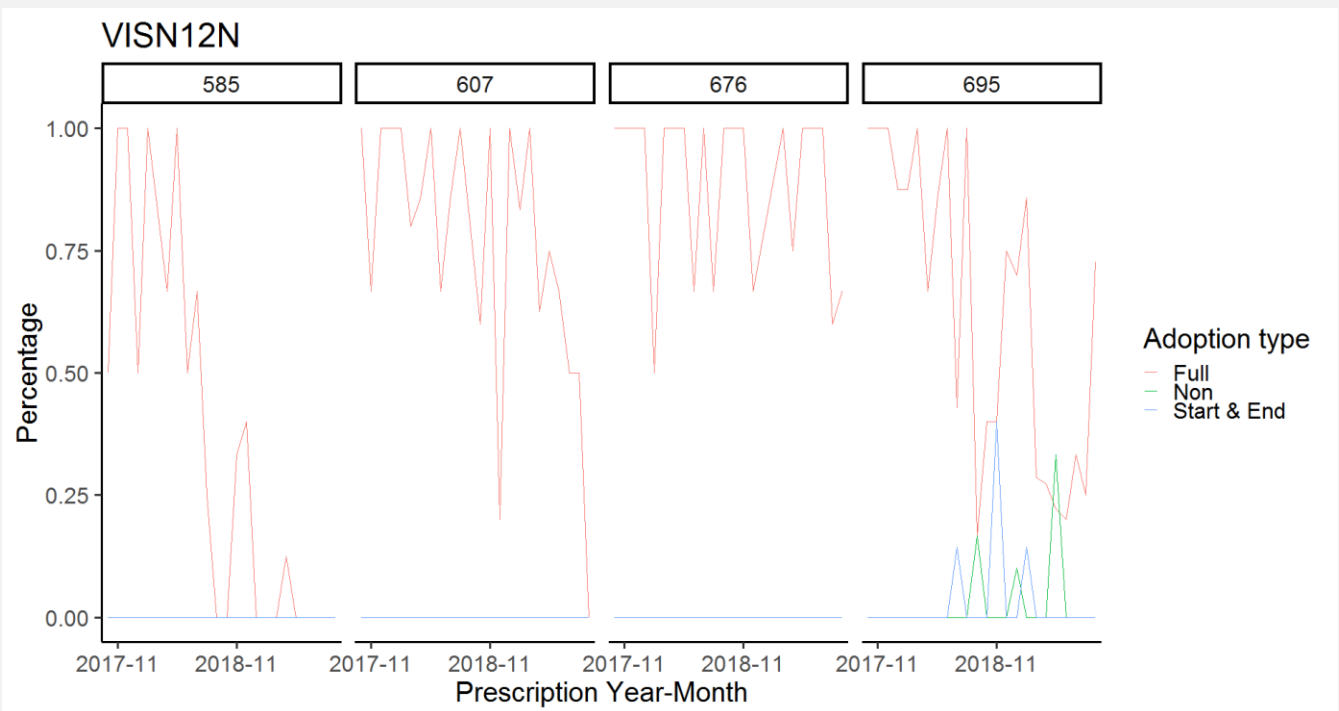


Figure 12. Adoption type and percentage in VISN 12N stations across year-months since FLOW3 implementation.

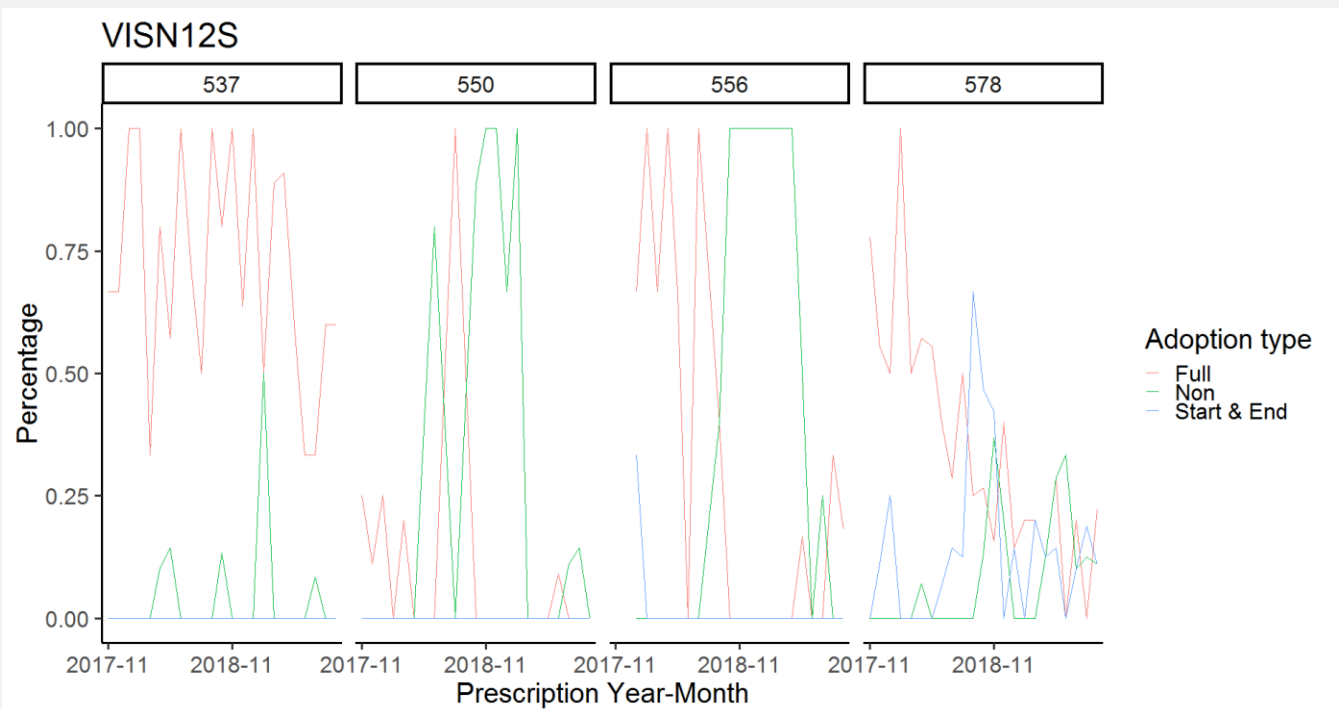


Figure 13. Adoption type and percentage in VISN 12S stations across year-months since FLOW3 implementation.

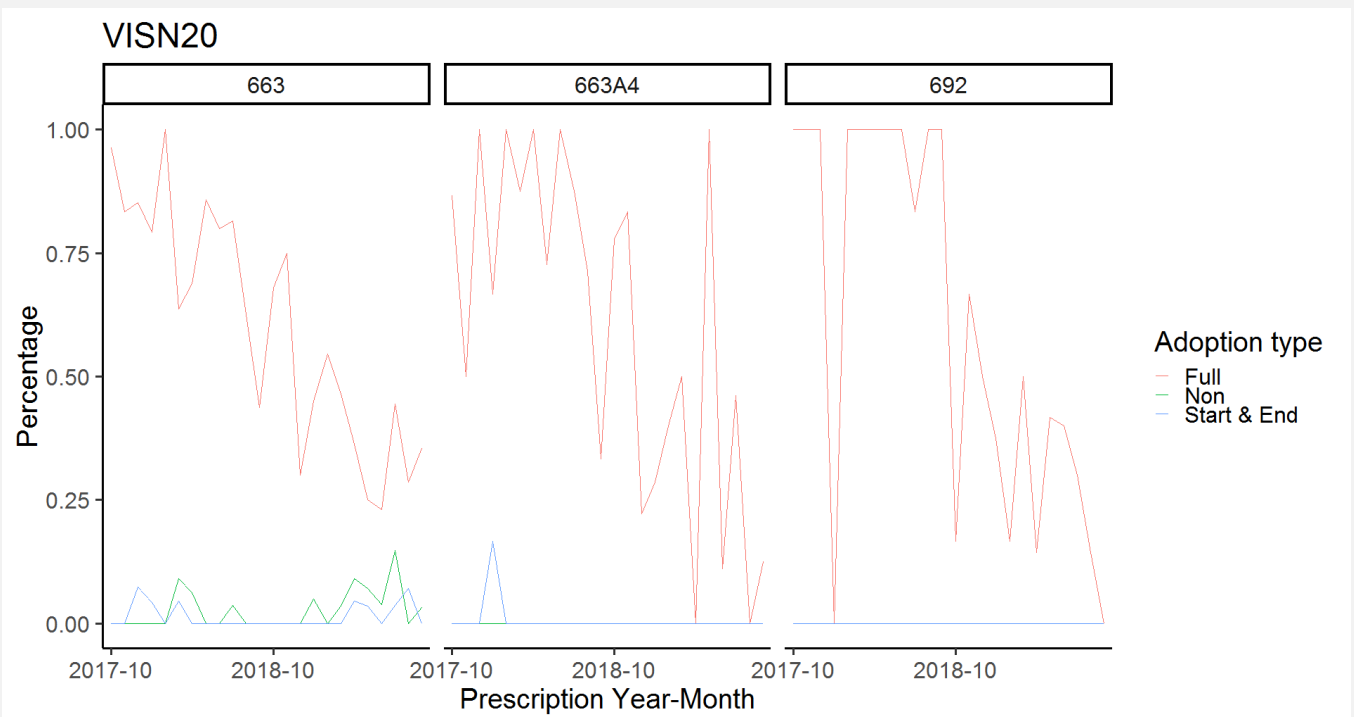


Figure 14. Adoption type and percentage in VISN 20 stations across year-months since FLOW3 implementation.

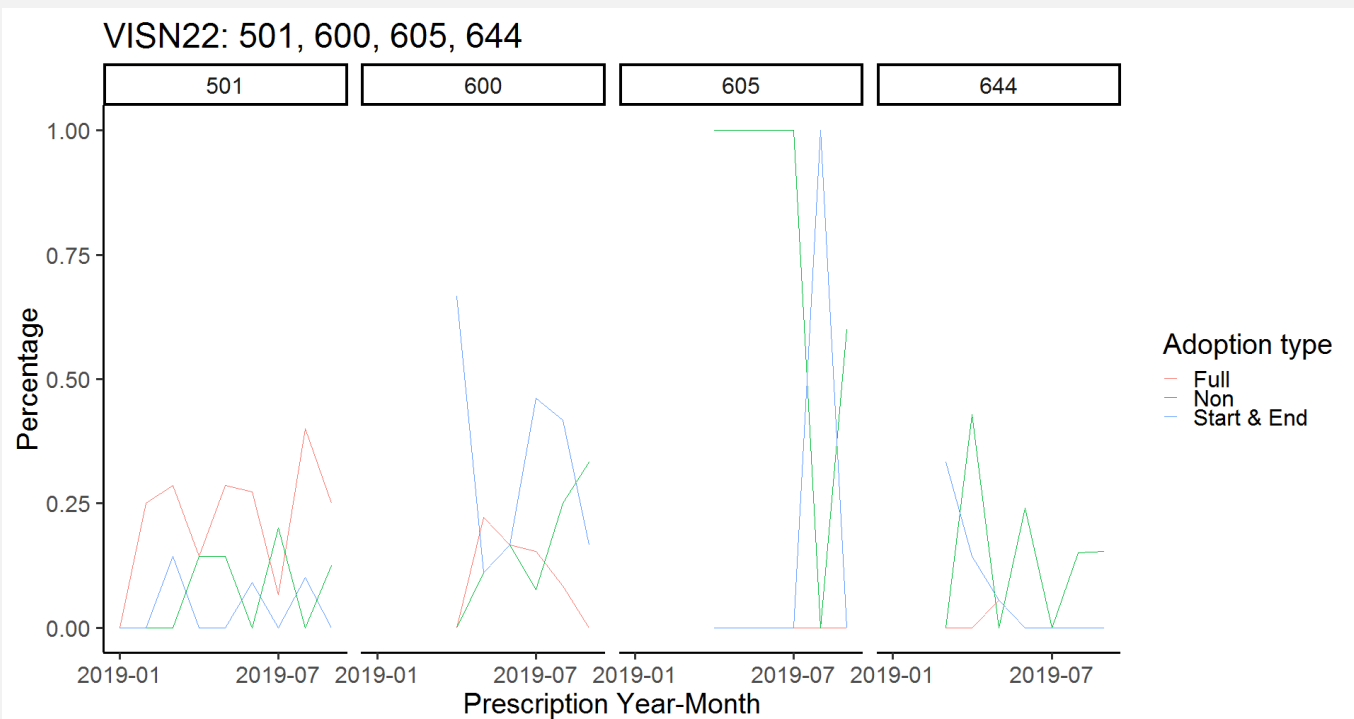


Figure 15. Adoption type and percentage in VISN 22 stations across year-months since FLOW3 implementation.

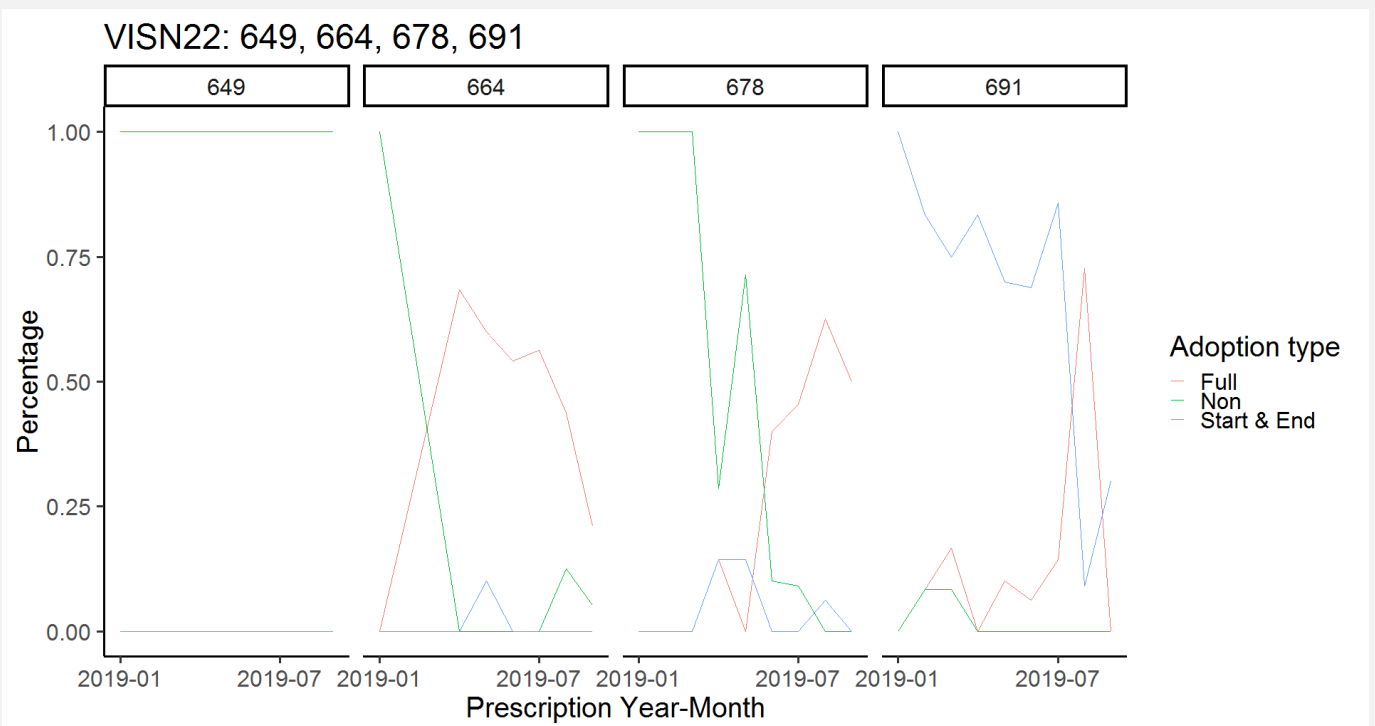


Figure 16. Adoption type and percentage in VISN 22 stations across year-months since FLOW3 implementation.

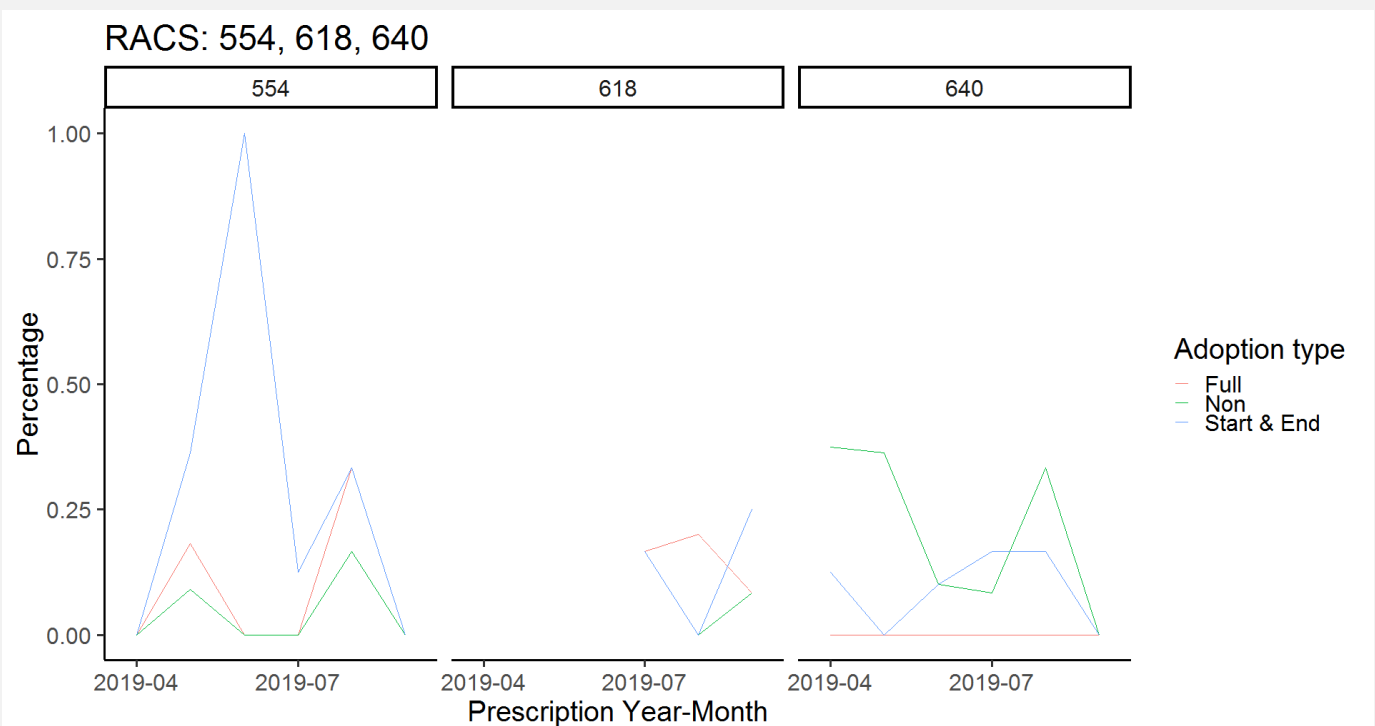


Figure 17. Adoption type and percentage in RACs across year-months since FLOW3 implementation.

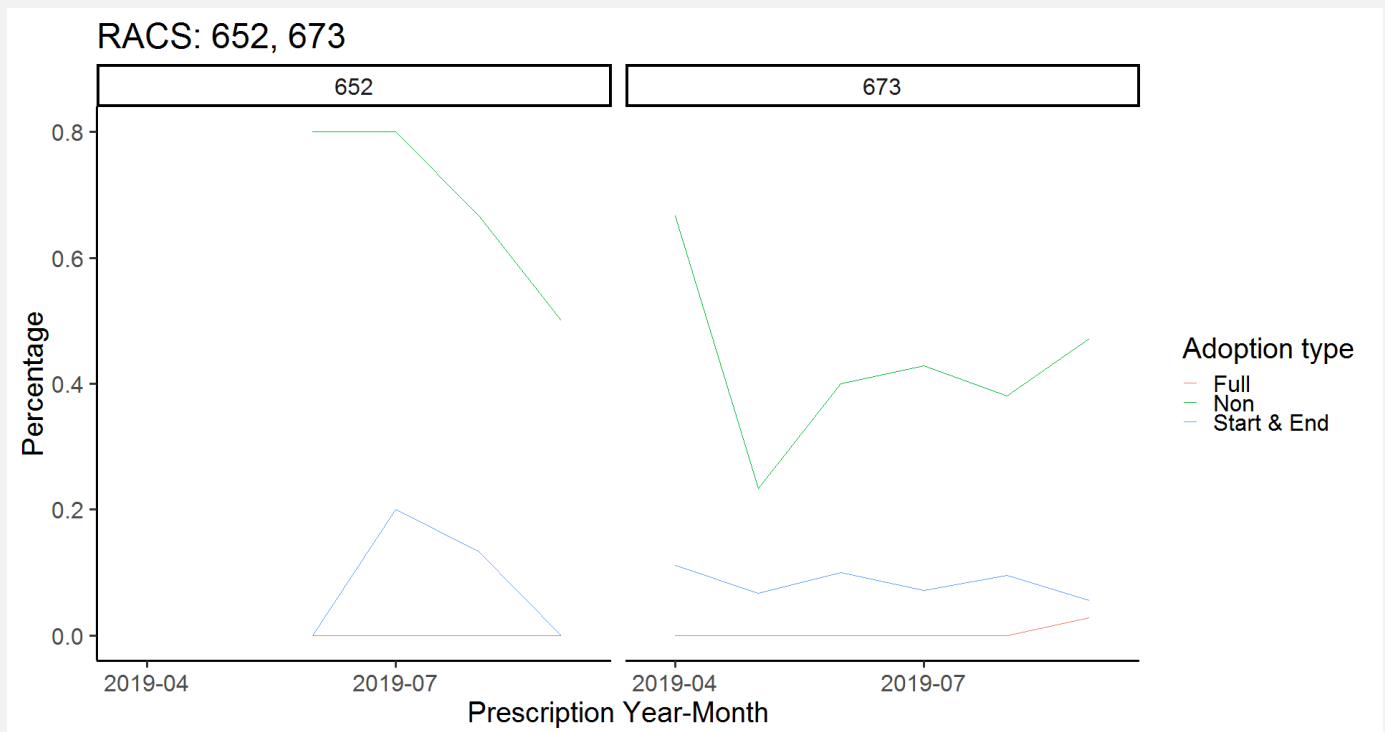


Figure 18. Adoption type and percentage in RACs across year-months since FLOW3 implementation.

Staff Level Adoption

We originally also planned to study adoption at the staff level. However, this has been challenging to implement. At this point in time, there is significant heterogeneity in the staffing models at sites for inputting data to FLOW3. We will continue to work with our operational partners to try and identify a feasible method of defining adoption of FLOW3 at the staff level.

Effectiveness: Identifying Changes in Timeliness

Overview

We sought to identify if FLOW3 implementation was associated with a difference in the timeliness of limb provision in the VA. This was challenging due to the limited data elements in non-FLOW3 data sources. We used the non-FLOW3 data to identify the time from prescription date to order date for the provision of prosthetic limbs, as this was the only timeliness available nationally prior to FLOW3. After analyzing the volume and cost elements of this dataset, our operational partners requested we focus on the above knee and below knee limb types as they seemed to have the most plausible distributions of cost and volume.

We implemented a difference in differences analysis (DiD) to identify if facilities that implemented FLOW3 had a different trend in timeliness following FLOW3 exposure when compared to control sites. The difference in differences analysis compares the pre/post trends in timeliness in the exposed facilities to the overall trend in timeliness at the non-exposed (control) facilities during the same time period. We then identify if there is a difference in the post intervention time period compared to the pre intervention time period. Figure 19 summarizes this method graphically.

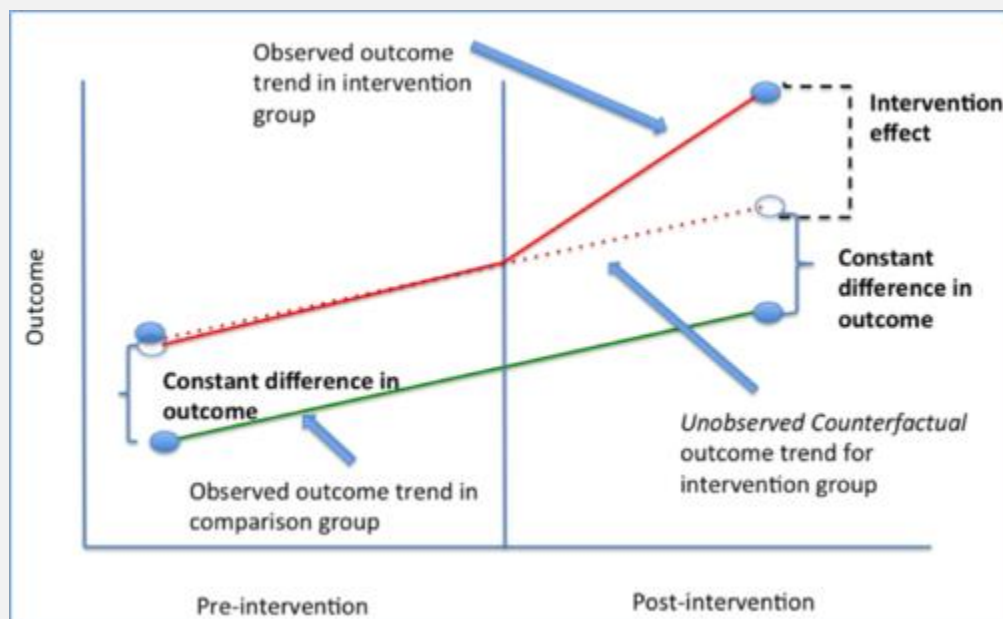


Figure 19. Source: Columbia.edu: <https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation>.

VISN20 effectiveness analysis in 2013

We implemented this analysis for VISN20 using June of 2013 as the intervention date, and all other FLOW3 groups as the control groups. Figure 20 summarizes the pre/post trends in both VISN20 and the control groups among Veterans with an AK or BK limb prosthetic. One assumption of the DiD method is that the intervention and control groups had identical slopes in the pre-intervention period. This is often checked qualitatively and visually. It appears the slopes in the pre period are similar for VISN20 and the controls, so we implemented the DiD estimator.

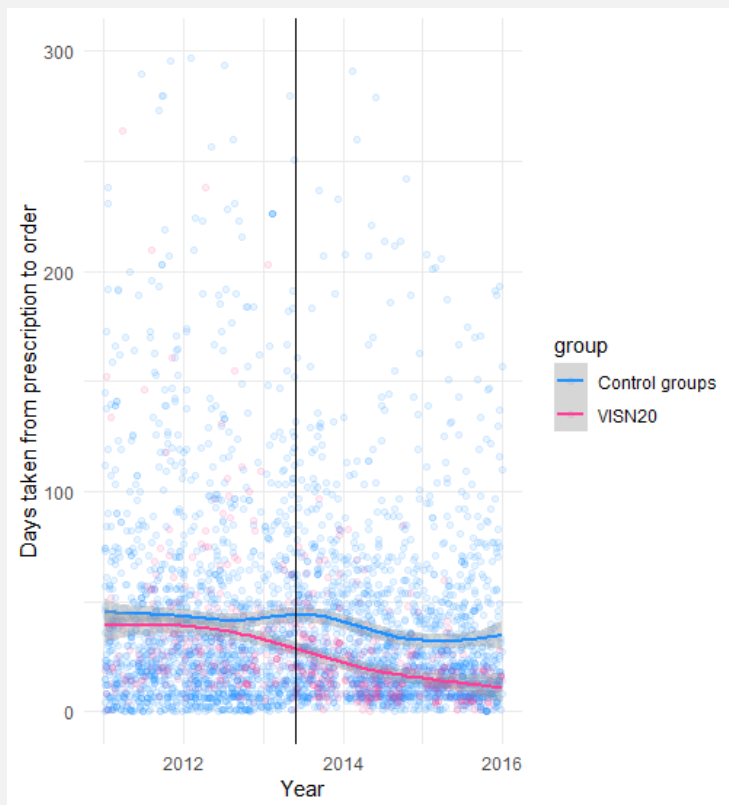


Figure 20. Pre/post trends in both VISN20 and the control groups among Veterans with an AK or BK limb prosthetic.

We implemented the difference in differences estimator using a linear modeling framework. Although we did find a small point estimate in favor of the intervention associated with exposure (slightly less days from prescription to order date when compared to control), the p-value was 0.17, thus we failed to find a statistically significant association between FLOW3 exposure in 2013 in VISN20 when compared to the control groups.

Table 3. DiD Estimator Linear Model for FLOW3 exposure in 2013 in VISN20.

	β (95% CI)	p-value
ConsultDate*Sta6aExposed	-0.01 (-0.03, 0)	0.17

VISN12 Effectiveness analysis in 2017

FLOW3 was implemented in VISN12 in September and November of 2017. We considered the FLOW3 sites exposed in April of 2019 to be the control groups for the VISN12 analysis (VISN20 was not included in this analysis since they were exposed in 2013).

The figure below descriptively summarizes the distribution of days from prescription to order date for VISN12 and the control groups. The black line indicates the exposure time in late 2017. We note that there does not seem to be parallel trends in the pre-exposure time periods for control and intervention sites. Given that, it is not appropriate to proceed with the DiD estimator. We do note descriptively that

there does not seem to be an improvement in timeliness associated with exposure to FLOW3 in VISN12 (there seems to be no association).

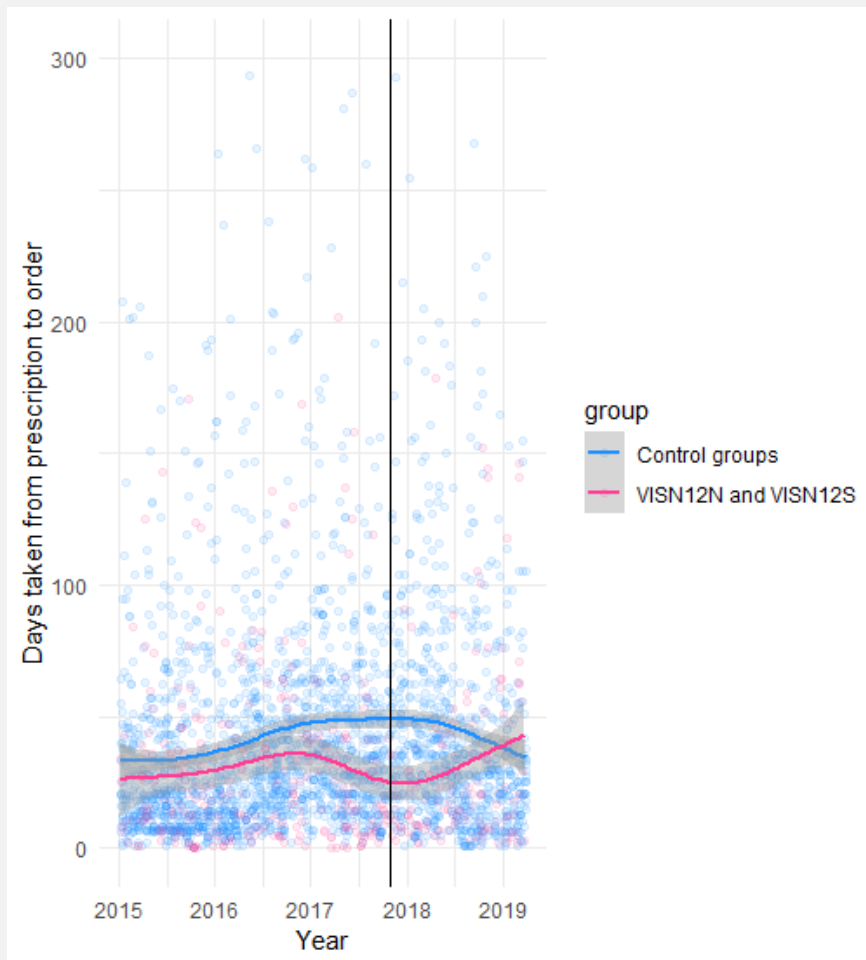


Figure 21. Pre/post trends in VISN12 and the control groups among Veterans with an AK or BK limb prosthetic.

[Summary of Findings \(Descriptive Summary of Pre-FLOW3 Data, Adoption, Reach, and Effectiveness\)](#)

- The available national data prior to FLOW3 (and at non-FLOW3 facilities) for cost, volume, and timeliness is of variable quality. This makes assessing the effect of FLOW3 on timeliness challenging, thus we do not over interpret the timeliness results in this report.
- FLOW3 has been implemented at a mixture of high and low performing facilities (with respect to timeliness at baseline).
- The timeliness and costs of prosthetic limb provision are highly variable both between and within facilities. There are some high and low performing facilities in terms of median timeliness, but most facilities still exhibit high variation in timeliness across their Veterans.

- The lack of full data capture of the process of providing prosthetic limbs prevents the VA from identifying the underlying causes of variation in timeliness of the full process. When fully adopted, FLOW3 fixes this issue.
- Adoption as measured by all FLOW3 process dates entered was highly variable by facility. This may be a training/documentation issue at sites, or it may be a true reflection of non-adoption of FLOW3 at sites.
- Using the non-FLOW3 data for pre/post/control analysis, we did not find evidence that FLOW3 implementation at VISN20 and at VISN12 was associated with an improvement in the time between prescription date and order date.

Process Maps

Background

Process maps are utilized in health care settings in order to understand and improve upon existing processes. Process maps were created for both limbs fabricated at the VAMC and limbs fabricated by an outside vendor as part of the FLOW3 Partnered Evaluation. These maps serve two purposes: 1) to understand the current prosthetic limb procurement process in order to learn how FLOW3 changes this process; and 2) to calculate the cost of this process. This section of the report will focus on the understanding current processes. Future work will assess how FLOW3 impacts the existing processes detailed below.

Methods

Through direct observation and key informant interviews, we investigated the current prosthetic limb procurement process across five VA Medical Centers (VAMCs; Lexington, Louisville, Memphis, Mountain Home, and Murfreesboro) in the VA MidSouth Healthcare Network (Veteran Integrated Service Network [VISN] 9).

We conducted qualitative interviews with front line staff directly involved in the limb procurement process prior to FLOW3 implementation. Pre-implementation interviews were conducted from July 1st – September 24th, 2019, with staff at the five VAMCs both prior to and during site visits. For each site, 1-3 interviews were conducted before the site visit and the evaluation team created draft process maps that were validated on site visits.

On site visits, the evaluation team conducted direct observation of the stages involved in the limb procurement process (scheduling, patient check-in, clinic appointment, creation of prescription, coding limb components, and payment). We noted the individuals involved in each process step and their time spent on each stage of the procurement process. Additionally, we conducted face-to-face interviews to discuss the procurement process and review draft process maps.

Finally, multidisciplinary groups met during site visits to review the preliminary process map. These groups ranged in size from three to six and included physicians, prosthetists, kinesiotherapists, physical therapists, department chiefs, purchasing and contracting agents, and MSAs. A detailed review of the preliminary process map took place and any missing or incorrect information was addressed. At the conclusion of this meeting the process maps were verified for each site. The evaluation team created a final process maps using Microsoft Visio.

Results

As shown in Table 4, we conducted 26 key informant interviews with a wide range of individuals to ensure we captured everyone involved in the process. Interviews focused on their specific roles in the prosthetic limb procurement process, time spent on this process and their perceptions of the current process.

Table 4. Individuals Interviewed.

Role	n
Physicians	5
Prosthetists and Kinesiotherapists	7
Chief of Prosthetics	2
Purchasing and Contracting Agents	6
MSAs	6
Total	26

We created nine maps illustrating the limb procurement process for both limbs being fabricated at the VA and limbs fabricated by an outside vendor (Appendix A, Figures 22-30; Mountain Home VAMC has one map since they do not fabricate limbs on site). The final maps depict the limb procurement process at each site prior to FLOW3 implementation. Maps detail the individuals involved in the process and their time spent on each process step.

The maps illustrate similarities and differences in the limb procurement process across sites. All sites have similar processes related to the cost of the prosthetic limb procurement process. When using an outside vendor, and the cost is above the \$10,000 threshold, the actions taken by the contracting agents involve the same steps, and they spend on average the same amount of time pulling the internal entry number (IEN) number, pulling the quote, verifying the prices, checking vendor certification, and entering the order in the procurement program APAT. When the cost is below the \$10,000 threshold, the purchasing agents across the VAMCs go through the same steps of creating the purchase order (PO) and sending it to the vendor and spend, on average, the same amount of time.

In addition, all sites have additional process steps when using an outside vendor. The added steps of having the vendor send their list of L codes and reviewing those codes increases the time spent by the prosthetists and physicians across sites. All sites also process payment to outside vendors in the same manner. Purchasing and contracting agents across sites emphasized that vendors are supposed to receive their payment after the limb is delivered to the VAMC.

For VA-fabricated limbs, sites reported that prosthetists spend between 15-23 hours fabricating the limb. Additionally, the process maps highlight that all sites have the same process for confirming the fit of the prosthetic limb. Prosthetists at all sites spend between 5-10 hours making necessary adjustments when the fit is not appropriate.

A key difference across sites is the personnel present at the clinical appointment and who writes the prescription. Physicians and prosthetists attend appointments at all sites, but at some sites MSAs, contracting agents, purchasing agents, kinesiotherapists, and outside vendors may also be present. At most sites, physicians write the prescription for the new limb, but at other sites the kinesiotherapist writes the prescription. The time spent writing the prescription was similar across sites (5-10 minutes).

Training Satisfaction Surveys

Background

Training satisfaction surveys were designed to assess satisfaction with FLOW3 training materials.

Methods

The 9-item survey was developed by the VACE team with feedback from the FLOW3 Diffusion Team. Surveys were administered using Research Electronic Data Capture (REDCap) and the results were analyzed descriptively. Three iterations of the survey were utilized to reflect A) the different modalities in which the training was administered (virtual training for Cohort 1 Champions; virtual training for other Cohort 1 frontline users; and in-person training for Cohort 2 Champions), and B) the FLOW3 users' role (champions and non-champions).

The training satisfaction surveys were disseminated in three waves. Training satisfaction surveys were administered to Cohort 1 site champions between February 21st and April 25th (Table 5) and to all other Cohort 1 users between July 3rd and July 24th (Table 6). Following an in-person training summit, surveys were administered to Cohort 2 site champions between August 19th and September 2nd, 2019 (Table 7).

Results

Feedback from individuals who received a virtual training format indicated that the preferred method would be in-person training. The virtual training was rated highly (25% rated the training as excellent, 63% rated the training as good, and 13% rated the training as average), however there was an emphasized desire for "live demonstrations with the ability to ask relevant questions as the topics occur in real time." The materials provided (videos, PowerPoints, and quick start guides) were seen as "fantastic resources, but live training exercises are the best education mechanism for software use." Participants of the in-person group training indicated that the training format was conducive to learning (33% strongly agree, 66% agree) and that the training content was organized and easy to follow (33% strongly agree, 66% agree). The results from the Cohort 1 Champion Training Satisfaction Survey, Cohort 1 Training Satisfaction Survey, and Cohort 2 Champion Training Satisfaction Survey, can be found in Tables 5, 6, and 7, respectively.

The training for this initiative was better served by switching the modality to a face-to-face format. The hands-on approach and interaction with the FLOW3 team allowed for better understanding, collaboration and real time resolve to concerns that was experienced by participants. Individuals who participated in the face to face training reported that they would have preferred additional time "so the whole process from start to finish could be observed in the web app." In regards to the length of training 17% disagreed about the length of the training being appropriate and 33% selected neutral.

Respondents specified that they were satisfied with utilizing VA Pulse. All respondents indicated that the supplemental reference materials on VA Pulse were useful (17% strongly agree, 83% agree). The majority of respondents (83%) indicated that the practice scenarios on VA Pulse helped reinforce the training (67% agree, 17% strongly agree, 17% neutral). Additionally, all respondents reported that VA Pulse is easy to navigate and they were able to locate the training materials effortlessly (50% strongly agree, 50% agree). The results can be found in Table 7.

Table 5. Cohort 1 Champion Training Satisfaction Survey Summary.

Question	N	Average Response (Likert Scale 1 to 4)
The virtual training format was conducive to learning.	8	1.8
The training content was organized and easy to follow.	8	1.9
The training content provided me with an overall understanding of FLOW3 relevant to my role as champion.	8	1.9
I was easily able to locate the training materials.	8	1.6
The instructions were easy to understand.	8	1.9
The training length was appropriate.	8	2.1
The supplemental reference materials were useful.	8	1.8
The practice scenarios helped reinforce the training.	7	1.7
How would you rate the training overall?	8	1.9
Response rate: 57% (8/14)		
Key: Strongly Agree=1; Agree=2; Neutral=3; Disagree=4; Strongly Disagree=5		

Table 6. Cohort 1 Training Satisfaction Survey Summary.

Question	N	Average Response (Likert Scale 1 to 4)
The virtual training format was conducive to learning.	17	1.7
The training content was organized and easy to follow.	16	1.6
The training content provided me with an overall understanding of FLOW3 relevant to my role.	16	1.8
My site champion supported me in completing the training.	16	2.1
I was easily able to locate the training materials.	16	2.2
The instructions were easy to understand.	16	1.6
The training length was appropriate.	16	1.7
The supplemental reference materials were useful.	16	1.9
The practice scenarios helped reinforce the training.	16	2.2
How would you rate the training overall?	16	1.8
Response rate: 22% (18/82)		
Key: Strongly Agree=1; Agree=2; Neutral=3; Disagree=4; Strongly Disagree=5		

Table 7. Cohort 2 Champion Training Satisfaction Survey Summary.

Question	N	Average Response (Likert Scale 1 to 4)
The in-person group training format was conducive to learning.	6	1.7
The training content was organized and easy to follow.	6	1.7
The training content provided me with an overall understanding of FLOW3 relevant to my role as champion.	6	1.8
The training material was easy to understand.	6	2.1
The training length was appropriate.	6	2.5
I was easily able to locate the training materials on VA pulse.	6	1.5
The supplemental reference materials on VA pulse were useful.	6	1.8
The practice scenarios on VA pulse helped reinforce the training.	6	2.0
How would you rate the training overall?	6	2.0
Response rate: 46% (6/13)		
Key: Strongly Agree=1; Agree=2; Neutral=3; Disagree=4; Strongly Disagree=5		

Organizational Readiness to Change Assessment (ORCA)

Background

The purpose of administering the Organizational Readiness for Change Assessment (ORCA) to all staff that participate in the prosthetic limb procurement process was to understand: 1) the perceived strength of evidence for the FLOW3 intervention; 2) the quality of organizational support to facilitate FLOW3 implementation; and 3) organizational capacity to implement and adopt FLOW3.

Methods

The ORCA survey is an 11-item questionnaire that assessed the three outcome measures described above. Participants answered each question a 5-point scale ranging from either “Very Weak” to “Very Strong” or “Strongly Disagree” to “Strongly Agree”. These pencil-and-paper surveys were administered to 19 staff members who participate in the prosthetic limb procurement process, which included amputation and prosthetic clinic providers, purchasing and contracting staff, and scheduling staff. Staff members were identified at the FLOW3 Cohort 2 Training Summit and VISN 9 VA locations, including Louisville, KY; Mountain Home, TN; Lexington, KY; Memphis, TN; and Nashville, TN. Survey results were then entered in Research Electronic Data Capture (REDCap) and analyzed descriptively.

Results

Participants were first shown the following statement and asked to answer questions:

Defining the roles and responsibilities of staff member disciplines and streamlining effective communication for efficiency in the prosthetic limb procurement process will:

- Contribute to improved timeliness and enhanced data systems to manage and report on the provision of prosthetic limbs to Veterans
- Improve employee satisfaction
- Improve the Veteran customer experience

There was high perceived strength of evidence for the FLOW3 intervention ($M = 4.35 - 4.42$), high perceived quality of organizational support to facilitate FLOW3 implementation ($M = 4.06 - 4.50$), and adequate perceived organizational capacity to implement and adopt FLOW3 ($M = 3.65 - 3.94$); however, the overall sample size was small ($N = 19$). No major differences by site nor role were noted. A table of these results can be found in Table 8.

Table 8. ORCA Survey Summary.

Question	N	Average Response (Likert Scale 1 to 5)
<u>Assessment of Evidence Basis for Above Statement</u>		
Perception of Clinical Experts' Opinion	19	4.42
Own Opinion	19	4.35
<i>Key: Very Weak=1; Weak=2; Neither weak nor strong=3; Strong=4; Very Strong=5</i>		
<u>Staff members in your organization...</u>		
Are receptive to change in clinical process	18	4.28
Are willing to innovate and/or experiment to improve clinical procedures	18	4.39
Cooperate to maintain and improve effectiveness of patient care	18	4.50
Have a sense of personal responsibility for improving patient care and outcomes	18	4.42
<u>Opinion leaders in your organization...</u>		
Work cooperatively with senior leadership/clinical management to make appropriate changes	18	4.29
Are willing to try new clinical protocols	18	4.29
Encourage and support changes in practice patterns to improve patient care	18	4.29
Believe that the current practice patterns can be improved	18	4.06
<u>In general in my organization, when there is agreement that change needs to happen...</u>		
We have the necessary support in terms of staffing	18	3.65
We have the necessary support in terms of facilities	18	3.71
We have the necessary support in terms of training	18	3.94
We have the necessary support in terms of budget or financial resources	18	3.65
<i>Key: Strongly Disagree=1; Disagree=2; Neutral=3; Agree=4; Strongly Agree=5</i>		

Qualitative Pre-implementation Findings

Background

As part of our pre-implementation evaluation of VA MidSouth Healthcare Network (Veterans Integrated Service Network [VISN] 9) sites, we conducted semi-structured qualitative interviews with potential FLOW3 users to learn about the current prosthetic limb procurement process and perceptions of the current process, understand perceptions of FLOW3, and to identify potential facilitators and barriers to implementing FLOW3. We also conducted interviews with information technology (IT) staff and clinical application coordinators (CACs) to understand the process for FLOW3 installation and to learn about facilitators and barriers to installation.

We identified several themes related to perceptions of FLOW3 and potential facilitators and barriers to FLOW3 implementation. Perceptions of FLOW3 were generally positive. There were perceived benefits for both Veterans and VA personnel. Participants discussed several potential benefits of FLOW3, including better tracking, standardized process, improved timeliness, and improved efficiency. The primary barrier to FLOW3 implementation was installation and securing an Authority to Operate (ATO). This caused delays in Cohort 2 rollout. Participants noted some potential challenges of using FLOW3. These included not having enough time for training (champions to train teams), resistance to change, and concerns around workload increase. Some staff knew very little about FLOW3 at the time of interviews.

Participants provided suggestions for FLOW3 training and implementation. These included providing an in-person training—the Cohort 2 summit occurred in-person in response to this feedback, the need for protected administrative time for champions to train their teams, additional training tools (i.e., a PDF with screenshot and a training syllabus), selecting both an administrative and clinical champion at each site, and making sure that all potential users are aware of FLOW3 implementation.

Below we provide detailed information on interview findings.

Methods

Interviews

Interviews were conducted using two distinct interview guides. One guide was designed for potential FLOW3 users including physicians, prosthetists, medical support assistants (MSAs), and purchasing and contracting agents. It was designed to elicit information about the current process for prosthetic limb procurement, user perceptions of the current process and of how FLOW3 would change the process, perceptions of FLOW3, and potential barriers and facilitators to FLOW3 implementation. The second guide was designed for CACs and IT personnel. It was designed to elicit information about the process of FLOW3 installation before adoption at each site. Interviews were conducted by telephone or in person and were audio-recorded, and transcribed verbatim. Interviews lasted between 20 and 60 minutes.

Analysis

We used an iterative, team based inductive-deductive approach to conventional content analysis. Initial code categories were created based on process, barriers, facilitators, and perceptions. Inductive codes were used to identify emergent ideas and were added throughout coding after discussion by team members. Emergent code categories were also added after team discussion. Consensus was reached using a team-based approach. Three analysts independently coded the same three transcripts and met

to discuss points of divergence and convergence, with regular conversations to discuss emergent codes. Analyses continued with emergent themes, categories, and conclusions. *Atlas.ti* v.8 was used for coding and data management.

Interview Participants and Findings

We conducted 36 interviews between July and December 2019. Table 9 describes participant roles.

Table 9. FLOW3 Pre-Implementation Interview Demographics.

Role	n
Physicians	5
Prosthetists and Kinesiotherapists	7
Chiefs of Prosthetics	2
Purchasing and Contracting Staff	6
MSAs	6
CACs and IT personnel	10
Total	36

Perceptions of FLOW3

When asked about FLOW3, participants' responses ranged from neutral to positive. While some participants identified potential challenges associated with using FLOW3, it was generally viewed with optimism. Neutral responses primarily came from participants who were unfamiliar with the program, and therefore did not feel confident expressing their opinions. While some participants expressed concerns related to the implementation and use of FLOW3, they tended to express that despite these perceived challenges, adopting FLOW3 would be an overall positive change.

General Perceptions of FLOW3

Participants generally viewed FLOW3 positively and agreed that it is a good program.

It [FLOW3] sounds like it's a really good program.

Prosthetist

[I]t [FLOW3] seems like a good, a good system.

Physician

It [FLOW3] looks like a good idea.

MSA

Limited Knowledge of FLOW3

However, many participants had not yet heard of FLOW3 or had only heard very little about it at the time of the interviews. Clinical staff (physicians, prosthetists, and kinesiotherapists) and prosthetic chiefs were more likely to be familiar with FLOW3 than administrative staff (purchasing and contracting staff and MSAs). Furthermore, participants who were interviewed later were more likely to be familiar with FLOW3 than those who were interviewed immediately after it was announced that FLOW3 was expanding to VISN 9.

I'm gonna be honest with you cause I don't know a whole lot about [FLOW3].

Chief of Prosthetics

So, like I said, we are just recently being shown that there is a new way of doing this program and as a clerk, I have very limited information on the whole thing [FLOW3].

MSA

FLOW3? I'm not familiar with FLOW3.

Purchasing Agent

Participants with little or no knowledge of FLOW3 were unable to predict how it would affect their workload.

Interviewer: *Do you have any thoughts about how FLOW3 would affect your current job responsibilities or workload?*

Respondent: *Yeah, again, I don't. I just don't really have enough information.*

Chief of Prosthetics

Interviewer: *And how do you think FLOW3 will change the current process here?*

Respondent: *I'm not sure whether it will 'til I know a little bit more about how this would be implemented, I really couldn't tell you.*

Kinesiotherapist

Other participants did not think it would change their workload much, if at all.

Generally, I don't think the way I do things now is gonna change that much. There's a clear on of communication, I clearly know what my responsibilities are and how to perform them, so that I don't really know if [FLOW3 is] going to change what I do at all.

MSA

I don't know the process that we're gonna be involved with, I don't know how [FLOW3 is] gonna affect purchasing agents. I don't know how that's gonna work. I was reviewing some of the slides, and it looks like there's a web-based something involved. So, I guess I'm asking, I'm maybe jumping the gun, so how is that gonna work?

Purchasing Agent

Some participants who reported knowing less about FLOW3 were curious to learn more about it and see how it would affect the prosthetic limb procurement process, including their own workload.

[I] looked through the PowerPoint a little bit. I'm curious to see how, how it [FLOW3] is gonna be beneficial to, you know, to the facility and to the process of it. Of course, you know a lot of times you read through stuff and you don't really see how it's gonna benefit, but once, once you get it up and running, then that's when you, when you do see the benefit, so yeah, I'm real curious. I'd like to be able to see it, you know, work.

Chief of Prosthetics

Perceived Benefits of FLOW3

There were a variety of ways in which participants anticipated that FLOW3 will positively impact both Veterans and VA personnel. These anticipated benefits include the following: improved timeliness and efficiency of the prosthetic limb procurement process; better tracking of prosthetic limbs; increased transparency; standardization of the process; and eliminating extraneous communication between the different people involved in the prosthetic limb procurement process. In addition, one participant was hopeful that FLOW3 would identify where additional FTEs are needed at their facility.

Improved Timeliness and Efficiency:

One of most common aspects of the limb procurement process that is expected to improve is the timeliness of procurement, as the Veterans “will be processed through the system much quicker” (MSA). Additionally, it’s widely regarded that “anything that makes [limb procurement] simpler for [the Veterans] would be good” (MSA).

I would expect [FLOW3] to expedite the process, there would be fewer delays.

Physician

[FLOW3] has the potential to speed up the time from the amputee clinic visit to prosthetic delivery.

Physician

[I]f [FLOW3] improves the flow like I'm hoping it will, it'll speed up the delivery of their item... I'm hoping that continuity of care improves.

Prosthetist

Participants stated that the improved timeline for procurement will improve Veteran care by reducing delays in the prosthetic limb procurement process.

[D]elivering prosthetic limbs sooner will improve quality of life since they won't experience delays.

Contracting Agent

In addition to the improved timeliness of the procurement process, FLOW3 will reportedly also improve the efficiency of the current process.

[FLOW3] is supposed to cut down on any errors [in the procurement process] . . . the end game is to get the limb to the Veteran faster.

Purchasing Agent

Better Tracking:

In the current prosthetic limb procurement program, there is no standardized way of tracking the progress of each individual limb. It is easy for Veterans to “get lost in the system” (Prosthetist) and lose track of parts ordered to build prostheses. One person admitted that their site’s “current way of data tracking is not very good” (Prosthetist).

[T]he FLOW tool, the outcome measures and the ability to graph outcome measures versus prosthesis over a timeframe and compare that to cost, that is insanely powerful, and that’s the biggest thing I’m looking forward to.

Physician

I just think it, the tracking will be a lot better. There’s less paper, you know, and everybody gets the information a lot sooner because everything is electronic, and you can just go to the system and see where everything is. There’s never a question about the status of something.

Physician

Increased Transparency:

Closely linked to better tracking, many participants felt that FLOW3 will positively affect both VA personnel and Veterans by increasing the transparency this process will bring to prosthetic limb procurement. Using FLOW3 will allow all individuals involved in the procurement process to know exactly where a specific patient is in the process. Participants explained that FLOW3 will allow personnel to check on limb status if Veterans call asking about it. They also explained that capturing information in one location will allow everyone involved to access it, rather than having to rely on person to know what is happening. This is important because if that one person is out on any given day, there will not be a delay in accessing important information.

[I]f a Veteran is inquiring about the status, everyone you know has access and can tell the status.

Physician

I suppose a good thing about it would be that anybody who has access to it could be able to check to see what the status of it is. I know that the way that I said I track stuff is, can be followed from right here, that way if I’m not here somebody else has access to it.

Purchasing Agent

I think it will be easier for everybody to see where a particular order is in the process of being completed. I think it will improve the ability to checkout patients, you know, at the end of the process, cause we’ll get notified and everybody can tell where we are in the process.

Physician

This increased transparency would positively impact Veterans because “it would give them some better understanding of where they’re at in the process” (MSA). Additionally, FLOW3 would act as a safe guard to ensure that no one will “slip through the cracks” (Prosthetist), as it is common for Veterans to feel that they “can get lost in the system” (Prosthetist).

Though tracking was named as a clear benefit of FLOW3, one participant worried that data entered into FLOW3 incorrectly could make it look like some people simply are not doing their jobs.

And if it's wrong, put it, you know, if it's put in wrong or it's not used correctly, then it's still screwed up data, so it makes the lab look like they're not doing anything, even though they could be doing it all the time, and they're busy as could be, so. I mean, that's what FLOW is, it's data collection and that way they can bring that data to the Congress or whatever, and it makes sense, I mean, they want to know, can you tell us where our money is going.

Prosthetist

Standardization:

Also related to tracking, FLOW3 is anticipated to standardize the prosthetic limb procurement process across different facilities. It was viewed as a tool that allows each facility to use the same process rather than using processes that vary from site to site.

My perception of FLOW3 is that it's almost like what we used to call Clinical Pathway, but it's more of an administrative pathway, and it's designed to make things more clear-cut, more standardized and give everybody a process that's written in the same language, that's written in basically is to be used as a tool to make sure that everybody is communicating and processing and the process is the same for each center.

Kinesiotherapist

Reduced Workload for VA Personnel:

Some participants stated that the implementation of FLOW3 may reduce the workload of staff involved in the limb procurement process. The system would involve "less paperwork," (Physician) which would free up time to see other Veteran patients.

[B]y reducing my workload, Veteran's care will be improved, that will give me more time to take care of more Veterans.

Prosthetist

In addition to completing less paperwork, participants discussed how they were looking forward to eliminating extraneous back-and-forth communication between the various people involved in the prosthetic limb procurement process. They stated that eliminating these steps could save a substantial amount of time.

When FLOW3 kicks in, a lot of what [name] and I do between clinic and the checkout appointment will be eliminated hopefully with some training, with training the vendors, we've already talked to [name], training the vendors, training our purchasing agents who will be doing our limb quotes, training the MSAs who will be doing the scheduling for in-house and scheduling for clinic, so [name] and I are gonna have to do some training with those folks, MSAs, so our job will be lessened between clinic and checkout.

Prosthetist

The one thing that I really appreciate about FLOW3 is the instant quotes . . . Cause that's where I see is gonna save us a ton of time. It's instant, it's automated, and it's, one of our biggest problems, you probably have seen it, is they'll put in a consult and then a purchasing agent has to convert that consult to a 1090, and we're not using a lot the L codes, so that 1090 can come back from the vendor a month from now, two months from now . . . Yeah, so that's the, and so a) it adds a lot of

time, and b) it leaves a lot to interpretation to the vendors . . . So, with this FLOW3, it automatically generates, cause the doctor and the prosthetist go through and assign all the L codes in clinic.

Chief of Prosthetics

One participant explained that while FLOW3 may slow them down initially as they learned the new process, it would lead to time savings around unnecessary communication in the long run.

I think that initially just like any new process, it'll take a while to get used to, so I think it may delay us by, you know, a few minutes an order, in getting used to the new process, but I think once it's implemented, you know, from my understanding, there won't be the need for so much PA [purchasing agent] review or contracting agent review. I think it will flow faster on the backend of getting that prosthesis to the patient because the payment's more smooth.

Physician

Identify the Need for Additional Full Time Equivalents (FTEs):

One participant thought that FLOW3 may help their team to understand where more FTEs are needed.

[I] have discovered that FLOW3 may also establish where the shortcomings are in each VA clinic where FTEs are needed and so, etc. Hopefully that helps, too.

Prosthetist

Perceived Challenges of FLOW3

Some participants also noted potential negative consequences of FLOW3.

FLOW3 May Slow Down the Current Process:

Staff at one site thought that FLOW3 could slow down their process because it is only updated once every 24 hours.

I think based on my discussions with prosthetics coupled with staff members who went to FLOW3 training last week . . . it could even slow things down a little bit for us, not for most medical centers, but because my understanding was that once the initial template and the order is put in, it has to upload over that night. It has to update so they can't process it until the next day and then once that next action is taken, say to send it to the processor in contracting, that you can't take action, they can't take action on it until it updates that night so again, you have another day, so there's like, there may be a two or three-day delay where our current process, it can be sometimes same day, all those three things that may take three days through FLOW3 may be done, not always, but oftentimes can be done in one day, but again, we're only talking my perception is we're only talking three days versus a process that's you know four to eight weeks long, so . . . I don't think that's gonna be a big change.

Kinesiotherapist

FLOW3 Could Replace In-Person Communication:

At another site, one person worried that the electronic communication captured in FLOW3 would replace in-person communication, and that staff would have fewer face-to-face conversations.

So, that's how we, what I'm worried about like right now we have direct communication between humans and you know, and we all kind of love each other, but you know, I don't want to, I don't

want to see that go away with software, and that's gonna be, I mean, you know, we're co-located on the same campus. We're gonna be more and more co-located as we go further, but there still is enough of a distance and separation that, you know, you could easily fall into just staying seated at your desk and you know typing an order instead of like hey, let's go call [name] real quick, you know.

Physician

FLOW3 May Increase Workload:

Some participants across sites were concerned that FLOW3 would increase their own personal workload because they would have to spend more time entering data and documenting what they were doing.

[G]etting [FLOW3] up and going . . . will probably be OK once you get used to it, but or you know, it doesn't matter working with it. It's a little bit more work and it's a little different because other people will be involved, but you know, we have to, we can work with it.

Prosthetist

I hope it, well, the problem is it's gonna pull me more over to the prosthetic side, and if we don't have the help, that's going to screw the other staff here . . . with the FLOW, the documentation is gonna be a lot easier, it's gonna be easier for everyone to see it, even a higher-up, which is good, which I think is very good, but it's going to require people to actually have the time to sit down to do that particular job.

Prosthetist

[It looks] like there might be sort of some added, compared to our current process, we might actually be adding steps in with communication between us that we're not doing right now, and I saw that, I saw that in the purchasing agent portion of the FLOW tool and then also in the clinic consult template. We just, because we're co-located and can talk regularly and know each other, I feel like we can eliminate, we've locally eliminated a lot of that formal communication.

Physician

However, the concern that FLOW3 would add a process step was accompanied by the perception that it would also improve tracking.

I think that, it's a tracking tool basically, even though there's gonna be a little bit more work, I think, computer wise and there's just a little bit more work on our side. I think it's, as far as the vendor, because once you sign off on it, my understanding of something will go to that vendor, but actually it's a little bit more work for the practitioner and even ordering, even ordering our own parts, I think, going through the FLOW3 and ordering even materials and things like, it's actually more work, but it's a tracking, an excellent tracking device.

Prosthetist

Potential Facilitators to FLOW3 Implementation

Participants discussed several perceived facilitators to FLOW3 implementation and use. These included team members being open to change, positive perceptions of FLOW3, and leadership support.

Open to Change

Many felt that their teams were open to change and willing to try a new way of doing things.

I think with a group, we've got a group that is open to change and open to anything that will improve processes for sure.

Chief of Prosthetics

We have a really good team. The [purchasing agents] seem to be quite open to it. [Name] is very good on computer, so he, and he seemed very open.

MSA

Positive Perceptions of FLOW3

Others discussed positive perception of the program, and local buy-in.

I'm gonna say the guys, the prosthetists/orthotists, they're, I think they're, they, assuming that they're behind this and they like the process, they like the concept.

Purchasing Agent

More Information Needed

Some participants thought that it would be helpful to learn more about how FLOW3 has impacted Veteran care at current sites in order to increase buy in.

I don't know. I guess more data on where it's already being tested and the results, the outcomes of the full implementation of it. I think seeing more of those numbers. They might be available, I just haven't seen them myself.

Purchasing Agent

Improving Veteran Care is a Good Reason to Adopt FLOW3

Many felt that FLOW3 would improve Veteran care and felt that this was a good reason to use a new program.

So, what's nice about that is, is OK, I die in a car wreck tomorrow. They hire another person that comes in. They can teach him FLOW and they could hopefully follow exactly what I did for the patient. So, I'm hoping that continuity of care improves with that.

Prosthetist

My overall perception is, you know, it's a new process where everything is more easily trackable. I think it will be easier for everybody to see where a particular order is in the process of being completed. I think it will improve the ability to checkout patients, you know, at the end of the process, cause we'll get notified and everybody can tell where we are in the process.

Physician

Leadership Support

Other participants felt that leadership support was critical to facilitate FLOW3 implementation and use.

Desire of director and assistant director of contracting & supply team members wanting to obtain quality, performance – relationships w/ facilities. Our desire to be innovative.

Notes from Conversation with Contracting Agent

Leadership support has played an important role in FLOW3 implementation and diffusion. For the second Cohort of expansion sites in VISN 9, the FLOW3 diffusion team held an in-person training summit for site champions that VISN leadership supported.

. . . they [VISN 9 leadership] certainly enabled us to, to perform, you know, the, the in-person summit. . . We, we had a, we had a [PM&R] leadership at the national level send out some, some support via email of, of the system, and I think that, that raised awareness a bit of, of some of the VISN 9 leadership folks

FLOW3 Diffusion Team

The FLOW3 diffusion team also identified the “political capital” of leadership to be integral to FLOW3 expansion.

. . . I can say that I may have leveraged the political capital of leadership more than the clinical side of our team needed to. Occasions primarily, the first two would be the two times that we went to, to install at a Cohort, so Cohort 1 go live and Cohort 2 go live were both met with conflict and difficulty from OI&T . . . I had to leverage to the full extent all the way up to [name] and [name], the executives of 10P4R. I had to bring in the executives of the Diffusion Excellence. I also had to make sure that the executives from the [location], [name] and others were involved and ITOPS leaders. It got so tough that it gets to a point where you have to weigh out is it worth my job or do, I call in my leaders, and I was very pleased that in those, those times that were difficult, I was able to call on them, and they came to our aid to great avail.

FLOW3 Diffusion Team

Potential Barriers to FLOW3 Implementation

Participants noted a few perceived barriers to implementation of FLOW3. Most barriers were related to time. Other perceived barriers included difficulty disseminating information about FLOW3 appropriately, limited computer skills, resistance to change, and staffing.

Need for Protected Time

Some champions mentioned that they do not have any protected administration time to dedicate to their role as champion. This was perceived as a barrier to ensuring that all FLOW3 users were trained appropriately.

I think they need to add a little bit more admin time for the practitioner or for anybody who's the champion, so you can go and actually mess with [FLOW3] . . . we need to train people, and we need to show them the education. . . . And they actually set aside time for us to do that, which I thought, I was real proud of [name] for doing that, so I think that needs to make sure that's kind of understood that there needs to be administrative moments where, you're going to go show them the videos, which would be nice, you do that and show them the training, that would be perfect.

Prosthetist

Disseminating Information Appropriately

One participant felt that it would be difficult to disseminate information on FLOW3 to the appropriate users.

Everybody getting all the information needed to the right people. If you do have a question, how do we do this or are we sure that's right. Who is there to go to?

MSA

Limited Computer Skills

Some participants felt that their computer skills might be a barrier to using FLOW3. They felt that detailed, step-by-step instructions for using each aspect of the program might help to overcome this barrier. They stressed the importance of adequate training for all users.

[The FLOW3 team is] as smart as can be, and they're intelligent, and they play with computers all the time, so you're dealing with patient or providers who are really good . . . So, we're not always like programmed into like here's how the computer works, you know, it's not really our field, you know.

Prosthetist

Just additional training in the whole FLOW3 process and making sure everybody's onboard and understands and if, you know, all team members are, have an equal understanding of their role in what's going on, and you know, if my, as probably one of the people who will have a primary role in it that if I'm not here, that my backup has the same knowledge and expertise so that we don't lose anything because typically I coordinate most all activities with the clinic or with the processes like this.

Kinesiotherapist

Resistance to Change

Some participants worried that teams might be resistant to change.

. . . sites may have pushbacks from their own facility or if they're a new CAC and they're not as familiar with building consults, but like I said, I've done this for a while, so, you know, it, I didn't find anything difficult with the setup of it or [name] is also very, he responds fairly quickly. . .

CAC

Hindrance might be how some are resistant to change.

Notes from Conversation with Contracting Agent

Staffing

Some participants also discussed staffing as a potential barrier to implementation of FLOW3. At one site, a champion worried about finding the time to train a part time physician.

Really, time for the training is, you know, it's just, I have [name] one day a week.

Prosthetist

Participants at another site discussed staffing more generally and felt that turnover of purchasing agents might be a barrier to using FLOW3.

We never have enough staff. I don't know of any VA that's ever been like man, we've got too many employees . . . We have high turnover. Our, mainly our purchasing agents, now the lab,

we're good. We don't, I've been here the longest, and we've gone, there's only been, as far as the lab, three, four new people . . . But purchasing agents, that's a high turnover rate. They're GS05's. They make less than an MSA and so we, they're not here long.

Prosthetist

FLOW3 Installation

Installing FLOW3 at Cohort 1 VA facilities (VISN 22 sites and the RACs) was a smooth process, and it was achieved within 30 days of the initial request. Comparatively, installing FLOW3 at Cohort 2 facilities (VISN 9 sites) was much more challenging. The factors that made installation at Cohort 2 sites include an unclear path to accomplishing this task, extensive and stringent security reviews, and some communication challenges. At the time of these interviews, the FLOW3 diffusion team was still navigating the process of FLOW3 installation.

The FLOW3 installation process is described below in more detail.

Finding the Correct Path for FLOW3 Installation

In their journey to install FLOW3, the FLOW3 diffusion team was directed down several different paths that proved to be unnecessary. One participant explained that it took a while for them to meet with the individuals who had the authority to make decisions regarding the installation of FLOW3. Two of the unnecessary paths included going to PRM and meeting with the ASP.net team. At the time of these interviews, the FLOW3 diffusion team was working on the secure code review for FLOW3 and hoped to obtain an ATO within the next two months.

We, we were sent to several different processes. We were asked to go to PRM, that was unnecessary, and we were asked to look at class 1, class 3 to class 1. While not necessary now, it's something we can revisit after ATO is finalized. And then, they put us in front of a group called the ASP.net team. That actually proved favorable, even though not necessary. It aligned [name], our developer, with other like-minded developers in his community, and we were, received an external review, or internal, an additional internal review. So, the bottom line is we are ready to install, but we are not allowed to install VISN 9 until we complete our 90-day interim ATO. We're working with our ISO currently, [name] and I, and we're going through the secure code review, and there are three components of FLOW3 that need to get a pass, so we've completed the consult comment tool that's passed, the web app, the primary web app for end users, that passed, and now we're in the final throws of the admin web app. Once that's done, we'll, our ISO will submit our first ATO package. We expect to complete that package by January, and we'll have about 45 days of actual via ATO at which point we're working now with our implementation manager and our clinical side of our team in the planning phases so that we could make good on those 45 days come January to finalize that installation at VISN 9.

FLOW3 Diffusion Team

[I]t took a number of meetings, to, to really get the right people in the room and have that decision rendered. . .

IT

At one point, the FLOW3 diffusion team was told not to continue with expansion in VISN 9, despite its current use in 25 other facilities across the country.

Being told not to [install FLOW3]. I was being told to stop in VISN 9. I think the whole time, I've worried and we've been, I've been thankful that we've been blessed every step and so when we finally got stopped at VISN 9, I think I was actually expecting that, you know, I was like wow, we've gotten this far, you know. And knowing that we have an out, that we have a solution, we have high-level personnel all the way across the board from VHA to IT now watching, providing oversight. I feel like they're rooting for us. We just have to complete the protocols, and we're well engaged and well on our way through those.

FLOW3 Diffusion Team

[I]t's still strange to me that, you know, we, we are safely being used in 25 facilities across the country, but to be able to add five more was felt to be too high of a risk for, for, for leaders and, and IT to, to accept, and so.

FLOW3 Diffusion Team

Security Concerns

One participant explained that a significant challenge to obtaining approval for FLOW3 installation was undergoing a rigorous security review. FLOW3 is a class three solution, which means it was developed at a local VA facility. The difference between class one, two, and three solutions was described as follows:

Class1 [is] nationally released software such as say CPRS. Class 2 is regionally support by the field enhancement and sustainment service line and that would be like the FLOW tool or like oh, some, some Class 2 reports or patient data object software, which we put in all of our sites, and then Class 3 is local software, which generally is supported locally by the site.

IT

One participant explained that the security review is very stringent. The VA has historically experienced significant issues related to facilities sharing their class three solutions with one another. In one instance, sites receiving an internally-developed application made changes to it that resulted in some Veterans not receiving their benefits while others who were not authorized to receive benefits did so anyway.

Yeah, and I, yeah, I think the big barrier is the security scans, getting it moved from a Class 3 to a Class 1 solution. . .

IT

[D]eploying these [class 3 solutions] on a network enterprise is dangerous, and we had one situation where one of these software cool little gizmos was mailed to another site and somebody tweaked it, and literally hundreds of Veterans were not provided the benefits that they were entitled to and other people that weren't entitled to benefits were getting benefits and it was a royal pain to run around and try to get that all corrected and months, months of work to get that corrected, so there were, you know, instances like that, that we could pinpoint and point out to the hospitals, cause the hospitals were passionate about being able to keep this capability because IT was responsive.

IT

Lack of a Technical Installation Guide

One participant explained that they did not receive a technical installation guide and had to reach out for help. Though they received information about FLOW3 and why their facility would be using it, they did not receive concrete steps on how to install it.

I saw the request to have it installed, but there was no real technical install guide or something that I could reference. The only thing I was receiving was the, the MOU, the implementation of FLOW3, a PDF file, but that was really just a justification over, overview of the product and why it's being implemented, but nothing really on how to set it up in our environment, so I had to reach out for assistance.

IT

Communication Challenges

Some participants experienced challenges around communication. One participant explained that they received conflicting messages about FLOW3 installation. Though there was a memo of support of FLOW3 encouraging local IT staff to support it, they were still reluctant to install it which resulted in a two-year delay.

It was, it was very difficult, mostly from, I don't know if it was a lack of communication or something, but we, we had a clear understanding that this had made it through the VA Shark Tank with a clear endorsement, and [name] even had, you know, instructions for local IT on implementing the package. He had a memo from, sorry I don't recall who, but someone pretty high up authorizing this at the local level, encouraging OIT support, and it seems like we ran into a bunch of hurdles with that. I know they had concerns about what the software did, but it seems interesting and I want to say bothersome, but how it's just difficult to communicate that like what is it you need to see from us to get this implemented, and we'd hear one thing, and then we'd meet that, and then there'd be another concern, so we, we hit kind of a delay in the [location] area with implementation.

CAC

While this was not necessarily stated to be a challenge, we found that CACs and IT personnel at different sites received notification that FLOW3 should be installed from different people. Directions to install FLOW3 were received from the following roles:

- Chiefs of prosthetics
- Application service line division manager
- The FLOW3 diffusion team
- Systems redesign manager
- VA Central Office

For CACs, this is Part of their Routine Job Duties

While several participants experienced several challenges related to FLOW3 installation, there were also some factors that made this process go a little more smoothly. The CACs who we spoke to explained that their role in FLOW3 implementation was not particularly challenging, as they do this kind of work

on a daily basis. They explained that OI&T handles the installations, while the CACs are involved in the configuration.

Well, the template's already been done. That was already created nationally, so we did not have to go back and build the template, and honestly, building consults, it's part of our day-to-day job, so, and it's, you know, it's not a difficult process to do.

CAC

[W]e do that on a daily basis. It's just an easy task.

IT

If you can follow instructions, it's pretty easy.

CAC

CACs test applications – in this case, the prosthetic consult templates – and make minor changes as needed.

What they did was, it was very easy because they sent me the TXML file and then like I said, any corrections to it, I would ask the chief of prosthetics and then she would tell me what she wanted corrected or [name] or [name], those are the guys I talked to, they would give me what they wanted in the FLOW3, and I would just replace it. It was very easy.

CAC

OK, so what I needed to do for FLOW3 is more in my realm of expertise, which is personalization of the software that's installed on all of our computers. For us, it involved installing or creating a consult service and then attaching a specified template request form onto the request services that we were instructed to set up.

IT

Suggestions for FLOW3 Training and Implementation

FLOW3 champions and frontline FLOW3 users in Cohorts 1 and 2 experienced several different modalities of FLOW3 training. In Cohort 1, all VA personnel received FLOW3 training virtually. Cohort 1 champions were trained virtually by the FLOW3 diffusion team, and then they went on to train their teams locally using virtual content. In Cohort 2, site champions attended an in-person training summit and were then tasked with training their teams. At least one site re-created the training summit locally, while others completed the training online.

While most suggestions from participants were specific to improving the FLOW3 training, there were some general suggestions related to implementation.

Participants from Cohorts 1 and 2 provided suggestions to improve all modalities of the FLOW3 training, which are explained below. Suggestions were provided through both responses on training satisfaction surveys and key informant interviews.

Interactive, In-Person Training is Preferable to Online Training

The Cohort 2 training summit was held in-person due to feedback from Cohort 1 champions that an interactive training would enhance the learning process for FLOW3. Some participants thought that “conducting interactive training via Skype” (Cohort 1 Champion) would be helpful, while others thought

that face-to-face training would be best. Below are some of the comments from Cohort 1 site champions explaining the benefits of in-person training.

Having [someone] present for a one on one would be helpful but I will get the hang of it.

Cohort 1 Champion

As with any software package, the best learning is 'using' it. The instructions and sample cases are valuable learning tools. Live training is best.

Cohort 1 Champion

The FLOW3 diffusion team agreed that interactive, in-person training is a better option than virtual training. They described that this modality ensures that A) they can observe individuals' reactions to the materials, and B) people are able to complete the training rather than simply hoping they have time to fit it into their busy schedules.

No, one of the, one of the big differences, I mean, and obviously this is no surprise to any of us, the ability as a trainer to see people, see their reactions, gauge their understanding, gauge their engagement versus the lack of that in a virtual environment and it's, you know, it's one thing when you're doing a 30-minute PowerPoint virtually in Skype as opposed to a significant training event like this where in Cohort 1, all we had the ability to do was say, well, did you do the training and let's talk about it, and more often than not, it was well, I really haven't had the time to sit down and do it yet where in this environment, everyone got the same training at the same time, interacting with us and each other, you know, receiving all the information, building on the information module to module to module. I don't think you can do that virtually. I really don't.

FLOW3 Diffusion Team

Likewise, Cohort 2 training summit attendees expressed that they liked this in-person training modality.

The training for this initiative was better served by having face to face. The hands-on approach and interaction with the FLOW3 team allowed for better understanding, collaboration and real time resolve to concerns that was experienced by participants.

Cohort 2 Training Summit Attendee

I liked how they had real live scenarios, and we actually got to use the program That was something new that I think that the VA should do more of cause we always go to trainings, and they show us like pictures of how it works . . . But it was really nice that we were actually able to use it, and they had scenarios laid out for us . . . we were [on] a computer, and they gave us a list of scenarios, and we actually got to use FLOW3.

Cohort 2 Training Summit Attendee

Several training summit attendees had suggestions to improve upon this learning modality. Participants disagreed on whether the training was an appropriate length. While most said they would have liked even more time, some said that the day two agenda could have been incorporated into day one.

I think it could of been longer or re-worked because of the training scenarios afterwards and having a lot of questions about.

Cohort 2 Training Summit Attendee

[Needed an] *additional day or two to allow process to flow from start to finish.*

Cohort 2 Training Summit Attendee

Would have been nice for an extra day. So the whole process from start to finish could be observed in the web app (due to the one day behind updating).

Cohort 2 Training Summit Attendee

Suggestion for future training, consider conducting day two's agenda to on day one. This would allow the participants the need 24 hours to obtain the data to complete all aspects of the exercise. As I understand it, there is a 24 hour lag time to populate data/information.

Cohort 2 Training Summit Attendee

In addition to suggestions to change the length of the training, participants also provided the following suggestions for improvement:

Shorten the training videos.

The videos are a little long, but it had good information given in them. I think making them a little shorter would be nice, but this may add to the number of videos.

Cohort 2 Training Summit Attendee

Watch the training videos before attending the training summit.

I think there would have been much more learned if we had did more hands on training with the system. I feel we could have watched the videos before we got to the training.

Cohort 2 Training Summit Attendee

Slow down the pace.

I think it was a little back and forth, and sometimes the information was given a little to quick and to fast. Then it would just slow way down.

Cohort 2 Training Summit Attendee

Ensure that attendees can access all training materials in advance to make the process smoother.

I really do think we should have made sure that the personnel using the system was able to pull it up before the training.

Cohort 2 Training Summit Attendee

Provide Additional Learning Tools

Some participants stated that they had different learning styles, and they additionally discussed tools they believed would be helpful for learning FLOW3.

PDF:

One participant explained that they would like a PDF showing all screenshots of FLOW3 throughout the entire process of the prosthetic limb procurement process. While they recognized that this would be a

long document, they said that it would be helpful to use for reference, especially while first learning how to use FLOW3.

[A] PDF file would be great . . . Showing every process, just like, just down the list, even break down like . . . Vista has it. I mean, it's a complicated one, but I mean, you can literally, here's the menu. You select this menu selection, and it breaks it down. Every step of what you do and why and what it's used for, so like I know they have, is there seven to this side of the window, I can't remember. You know, you have your consult and . . . I know, I know it could be a lot, but it's a great reference cause sometimes sitting there showing me, I need to do it. I need to work through it.

Cohort 2 Training Summit Attendee

Training Syllabus:

In contrast to the PDF suggestion, another participant suggested creating a syllabus with only a few "check your work screenshot[s]" (Physician) to assist with training. As this person said they are not an auditory learner, this type of tool would be more helpful to them than the videos.

I did the available training, and I already gave them this feedback, but I'm not a, I'm not an auditory learner at all, so watching those videos was so not, not helpful for me. I'm very tactile and a little bit visual, so I would've rather had, give me a syllabus of steps with like, you know, no screenshots at all, or maybe just an occasional check your work screenshot and let me sit there and play with the FLOW3 program and use the mouse and find the little box that I need to click.

Physician

Select More than One Champion at Each Site

One participant stated that each site should have two site co-champions: one in a clinical role and one in a non-clinical role. They explained that this would assist frontline users in learning FLOW3, as clinical and non-clinical personnel have very different roles in the process and different areas of expertise.

I also think it would be helpful to identify multiple "champions" at a site - one to handle the roll out with respect to the clinical providers and another with expertise to handle the roll out to the procurement staff. Initial training should occur for the whole group to provide the entire process from beginning to end with a few examples, but then the follow up, more targeted training, should be handled by local people with specific expertise in their domain of function (i.e. clinical vs. procurement).

Cohort 1 Champion

The same participant further explained:

It is difficult for a single individual, designated as "Champion," to gain the expertise to teach all aspects of the FLOW, in the details needed, for each end user. To adequately teach FLOW, the person teaching must have a solid knowledge of how all processes work in and out of FLOW - including the procurement process and the lingo that goes with it. Given the diverse role each of the FLOW3 users have in the process, it makes better sense to identify both clinical and admin/procurement experts as co-champions.

Cohort 1 Champion

The FLOW3 diffusion team also discussed their observations that administrative staff have been less engaged overall with FLOW3, which supports the assertion made by the participant above.

So, most of the information that we've received from purchasing and contracting has been through our champion by way of a complaint, a misunderstanding . . . if we're gonna move over to mass migration or mass scaling, that's going to be, get complex quick, and we're gonna need to have protocols in place for training that outlier community, purchasing and contracting.

FLOW3 Diffusion Team

Separate Training for Contracting Agents

One participant explained that a separate training for contracting agents would be helpful. Most prosthetic contracting agents in VISN 9 are in one single location, which makes it difficult for local staff to work with them directly.

I think there's, once [FLOW3 is] installed in the system, it's gonna take time I think that, I think contracting is gonna still need some training. I think that, I know that you have your champions, but the champions can, and prosthetics can work, have a better opportunity to work with the purchasing agents, but, for example, here, [name] just happened to be stationed here in [location] because that's where she lives and where she works for contracting. Most of them are in [location], which is 3.5 hours away, so it's gonna be pretty hard for those practitioners or those champions to work with contracting and they're maybe 2, 3 hours away.

Prosthetist

Training from Other FLOW3 Users

One participant suggested that the training be led by FLOW3 users who had not developed the program. They explained that the developers might think FLOW3 is simple because they created it, but the program may be challenging for users with less confident computer skills.

While these guys are the developers and the users, they're always thinking this way. Their mind is set and to them, it's simple. This is just so, you just go, and you go over and you click, and you drag the end, it's like wait a minute, what did you just do?

Prosthetist

This suggestion is consistent with the FLOW3 diffusion team's idea that including FLOW3 users from other sites would be helpful to make the training more relatable to those in attendance.

I would like to see someone from the physician side to join us, to just provide some of that, some of that input, you know, it would be nice to have someone from each discipline so that when we are discussing those aspects and the handoffs between different disciplines, then they could, they could kind of refer to their own experience and share for the whole group.

FLOW3 Diffusion Team

Protected Time to Complete Training

One concern among site champions was the need for protected time to ensure local staff completed their FLOW3 training. Without this time built into their schedule, it is difficult to be available to teach new concepts and answer questions.

I think they need to add a little bit more admin time for the practitioner or for anybody who's the champion, so you can go and actually mess with it . . . I have been given no admin time.

Prosthetist

Keep Everyone in the Loop

One participant stressed the importance of ensuring that all relevant parties, especially facility heads, are included when discussing and preparing for FLOW3 implementation so that everyone is informed of what is happening.

Change is good, will benefit someone close to them – friend, family, coworker. Brings heads of all facilities together at forefront they are de facto speakers for facilities. Everything that goes wrong, they [heads of facilities] get blamed for, so would want to be brought in for something good.

Notes from Conversation with Contracting Agent

Summary

Overall, participants related positive perceptions of FLOW3 and think that implementation will improve processes and Veteran care. While there have been some challenges related to training staff and FLOW3 implementation, the delayed ATO was the only true barrier to implementation. Participants provided several suggestions to enhance implementation and training. The FLOW3 diffusion team agreed with much of the feedback regarding training, primarily that in person training is preferable and that learning from FLOW3 users in addition to developers would be helpful for training new users.

Some findings provide actionable feedback for implementation of FLOW3 at future sites:

- Administrative roles are less likely to be familiar with FLOW3. Targeted outreach to different groups may enhance FLOW3 adoption.
 - Targeted outreach materials that champions can use to introduce FLOW3 to different roles may be useful.
- Champions find it difficult to ensure that all users are trained to use FLOW3. Increased communication and follow-up with champions about challenges may help ensure that all users receive training.
- Participants discussed various levels of comfort with computers and various learning styles. Providing training materials using various educational media may be worthwhile.

Next Steps

Reach

We will continue to identify the total number of facilities and Veterans impacted by the FLOW3 program to document the reach of the program.

Adoption

We identified high variation in facilities adoption as measured by our proposed metrics. We will continue to review these results and metrics with the FLOW3 operational leadership to understand the source of this variability and possible improvements to the metrics.

We have not implemented staff level adoption at this point. We have discussed with our operational partners how to identify which staff members are expected to be inputting data at different VA facilities. There is heterogeneity by facility in these expectations, so we have not found an ideal method to track staff level adoption. We will work with our operational partners and the FLOW3 data to identify subtypes of facilities that we could apply a uniform staff level adoption metric.

Effectiveness (Timeliness)

There are a few challenges for the timeliness analysis. The timeliness analysis was hindered by our perception of poor-moderate data quality for non-FLOW3 time periods. Also, we are continuing to discuss which facilities are appropriate controls for each FLOW3 group exposed.

Economic Analysis

The return on investment of implementing the FLOW3 process will be assessed as part of the Aim 3 evaluation efforts. To calculate the return on investment of FLOW3, we will calculate the cost of implementing FLOW3 (Part 1) as well as the cost offsets associated with FLOW3 implementation (Part 2).

Part 1

To calculate the cost of implementing FLOW3, the project health economic investigator has had numerous meetings with FLOW3 Diffusion Team to identify the cost components associated with FLOW3 implementation from the facility's perspective. These cost components include: 1) Have a computer applications coordinator communicate with the FLOW3 team and upload the template into an electronic health record; 2) Get facility personnel access to BISL; and 3) Have facility personnel complete training. For each cost component, a data collection strategy was determined in order to collect data on the number of units (e.g. time spent) and unit cost (e.g. wage for associated personnel) for each cost component. FLOW3 team members reached out to personnel completing each of the three tasks and asked them to report time spent to collect data on the number of units. This work is complete. From these data collection efforts, we learned that the time the computer applications coordinator spent communicating with the FLOW3 team and uploading the template is approximately 45 minutes. The time spent getting personnel access to BISL is approximately 5 minutes per user. The time spent in training is 100 minutes per person training. We are currently collecting data for the unit cost (e.g. wage for associated personnel). We have retrieved the names and titles of individuals for each cost component and are now retrieving average hourly wages for those individuals. Once those wages are retrieved, we will calculate the total cost of implementing FLOW3 from the facility perspective. This work will be completed by the end of April 2020.

Part 2

To calculate the cost offsets associated with implementing FLOW3, the total cost of the prosthetic limb process (from prescribe to verify) will be calculated separately for the pre-FLOW3 and post-FLOW3 period. The analysis will assess cost offsets from the facility perspective, and thus only costs to the health system will be incorporated. Members of the FLOW3 evaluation team conducted site visits to facilities (Lexington, Louisville, Memphis, Mountain Home, and Murfreesboro) prior to FLOW3 implementation and created detailed process maps of the prosthetic limb process prior to the implementation of FLOW3. These process maps are finalized and are currently being monetized by monetizing personnel time associated with each step of the process. We will complete the calculation of pre-FLOW3 cost by the end of April 2020.

Veteran Satisfaction (IVR)

On 1/13/2020, we pulled a list of Veterans who had received a limb in the previous six weeks. This resulted in 250 Veterans. Out of these Veterans, 58 responded to the IVR survey giving a response rate of approximately 23%. Going forward, we plan to pull another list of Veterans toward the end of February and conduct another round of calls.

FLOW3 Implementation and Sustainment Toolkit

We are working with the FLOW3 Diffusion Team and an undergraduate level graphic design class at the University of Colorado Denver campus to design an implementation toolkit that includes guidelines for site champions, training materials, publicity materials to help disseminate information on FLOW3 implementation, and recommendations for optimizing FLOW3 adoption to ensure sustainability. We will review a draft toolkit with the FLOW3 Diffusion Team in March 2020 with the goal of completing a toolkit prior to FLOW3 expansion in Q3 and Q4. We will evaluate user satisfaction with the toolkit using surveys and interviews and make any necessary revisions prior to national expansion of FLOW3.

Provider Satisfaction Interviews

The qualitative team is currently conducting interviews with FLOW3 users in VISNs 12, 20, and 22, and the RACs to learn about their experiences using FLOW3. The goals of these interviews are to:

- Learn about provider satisfaction with FLOW3
- Learn about positive or negative consequences of FLOW3 on workflows and communication between individuals involved in different steps of the prosthetic limb procurement process
- Assess perceived effects of FLOW3 on outcomes for Veterans who receive prosthetic limbs
- Assess satisfaction with implementation of FLOW3
- Learn about barriers and facilitators to implementing or using FLOW3

At the time of this report, 27 provider satisfaction interviews have been conducted. Qualitative analysis of these interviews is in the beginning stages, and analysis will occur concurrently with data collection. These findings will be used to show how FLOW3 has impacted the prosthetic limb procurement process at sites where it has been implemented and to inform the expansion of FLOW3 to additional sites in the future.

Training Satisfaction Surveys in VISN 9

Training satisfaction surveys are still in progress for VISN 9 FLOW3 frontline users. As sites are completing their training based on their own timelines, surveys have not yet been sent out to all VISN 9 expansion sites. The same survey instrument described on page 24 will be utilized.

Appendix A

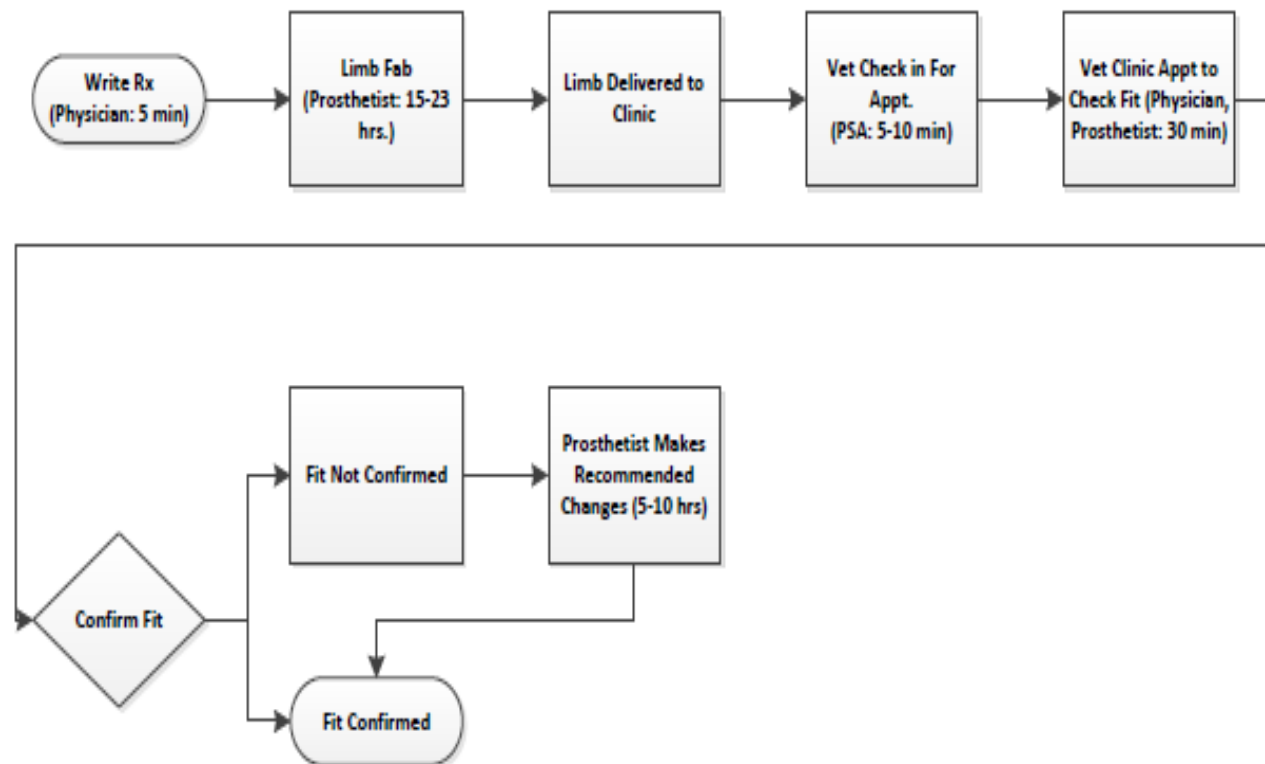


Figure 22. Lexington VA Fabrication Process Map.

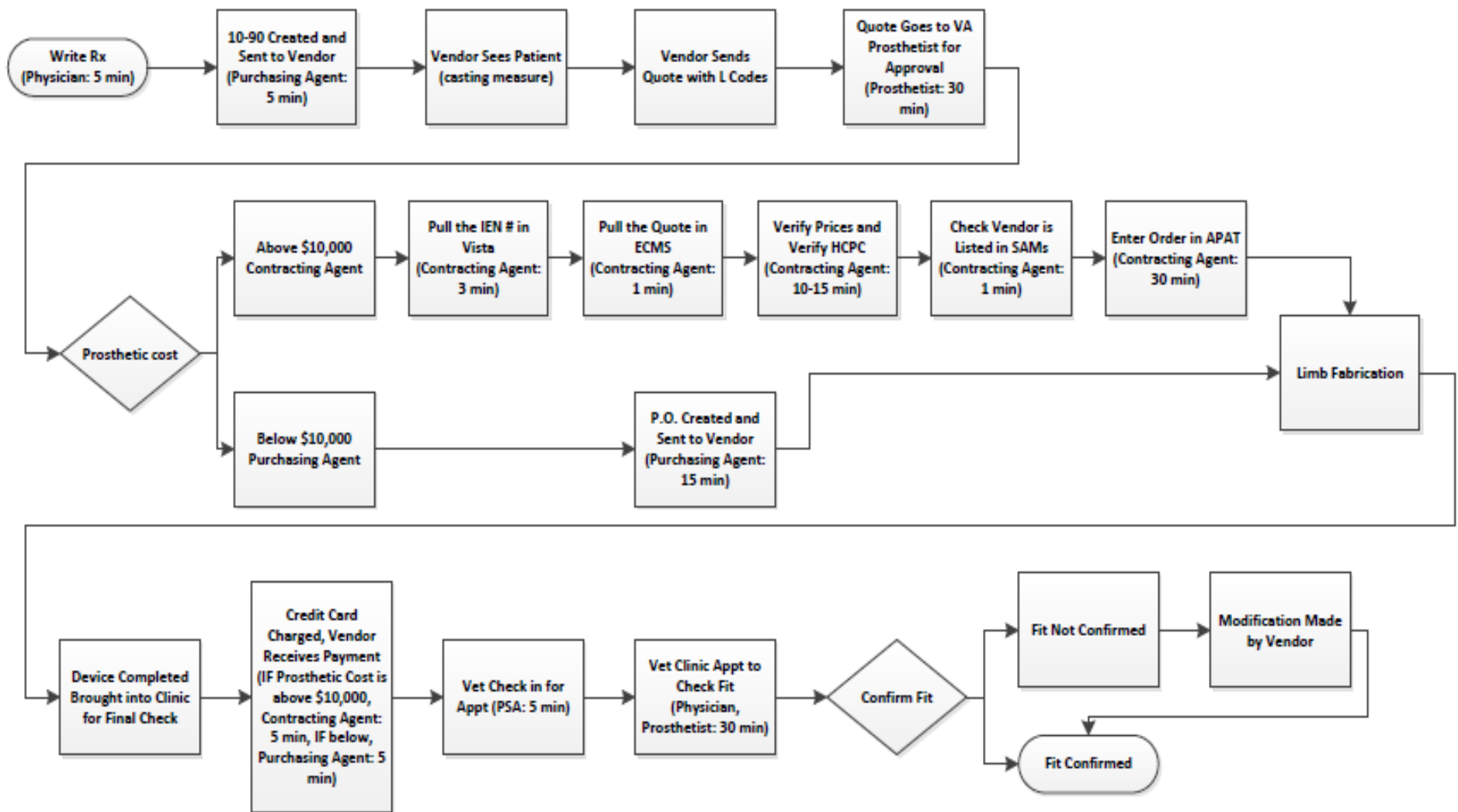


Figure 23. Lexington Outside Vendor Process Map.

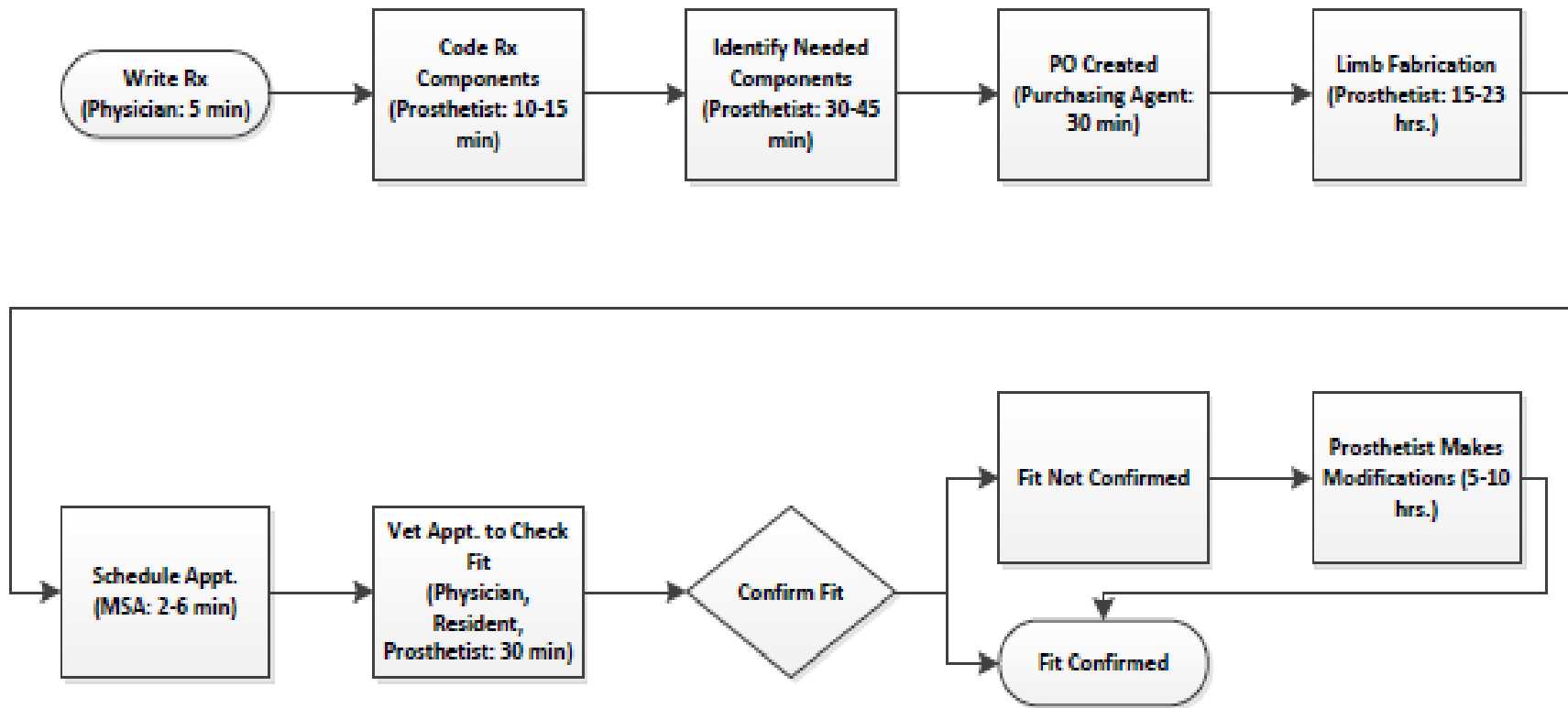


Figure 24. Louisville VA Fabrication Process Map.

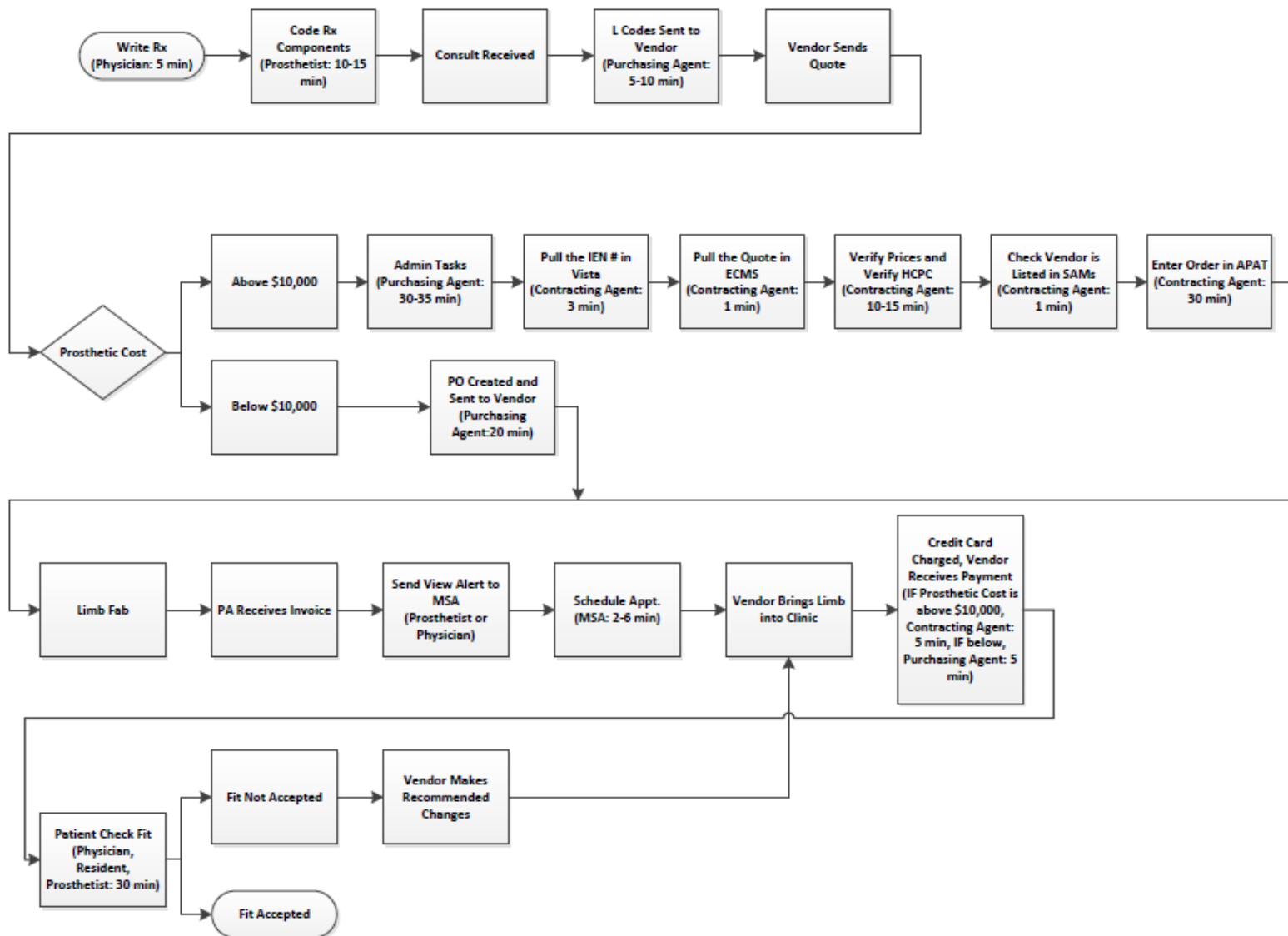


Figure 25. Louisville Outside Vendor Process Map.

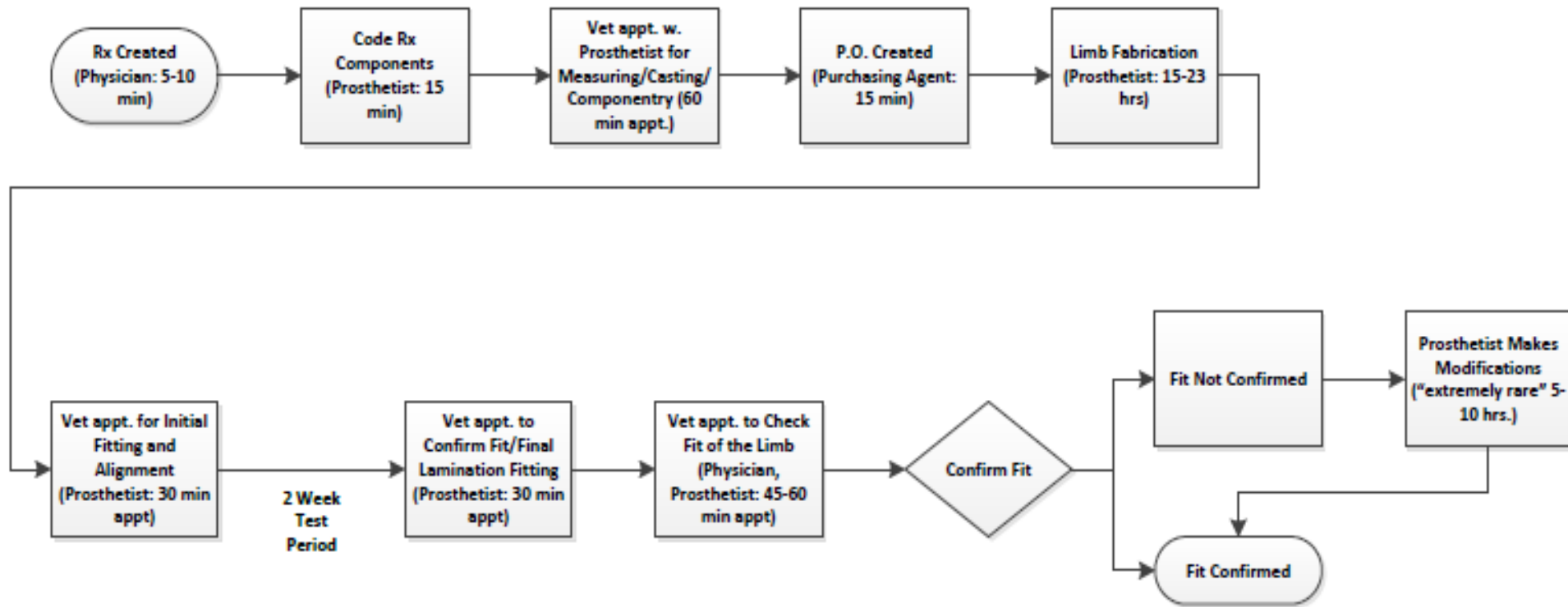


Figure 26. Memphis VA Fabrication Process Map.

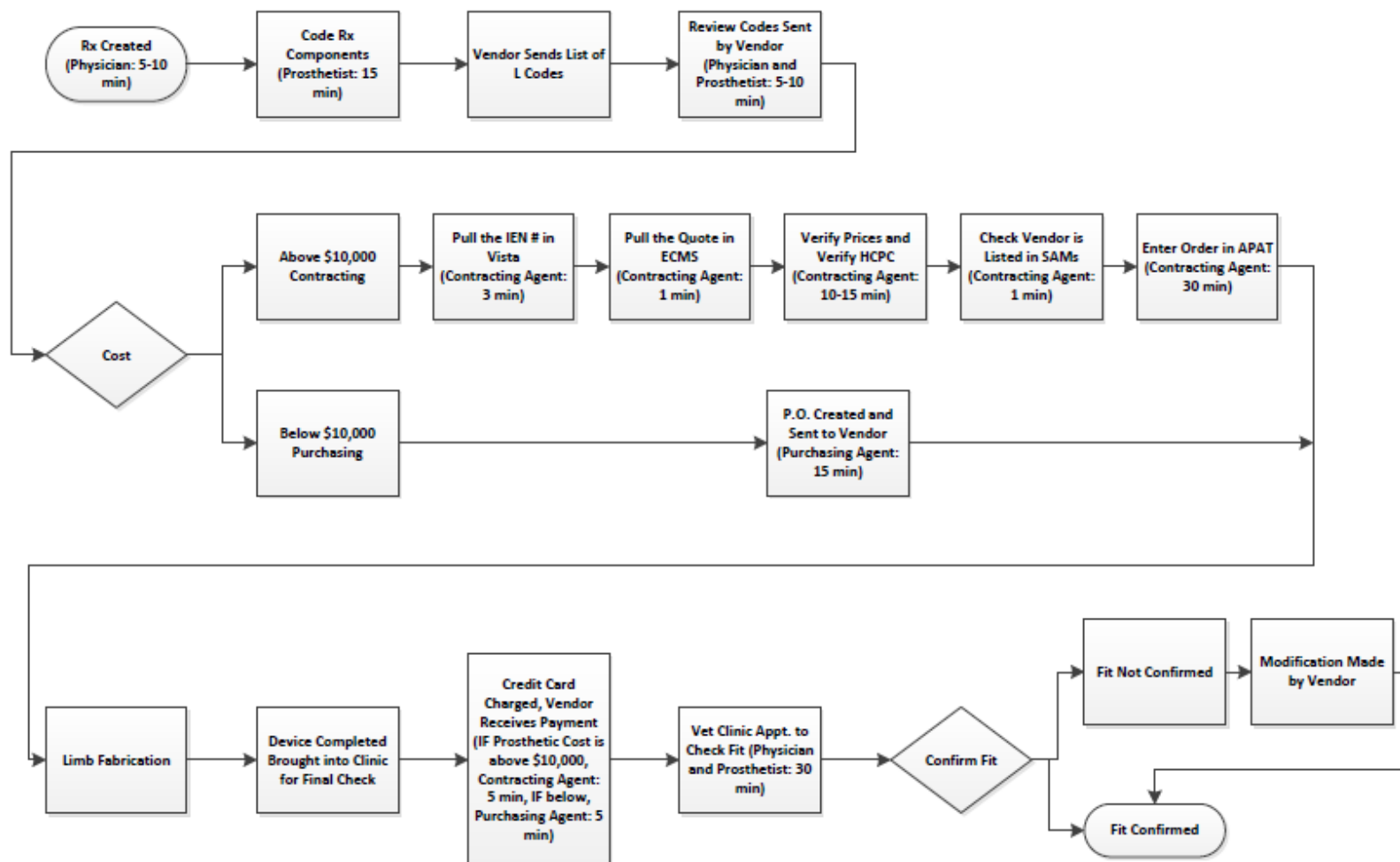


Figure 27. Memphis Outside Vendor Process Map.

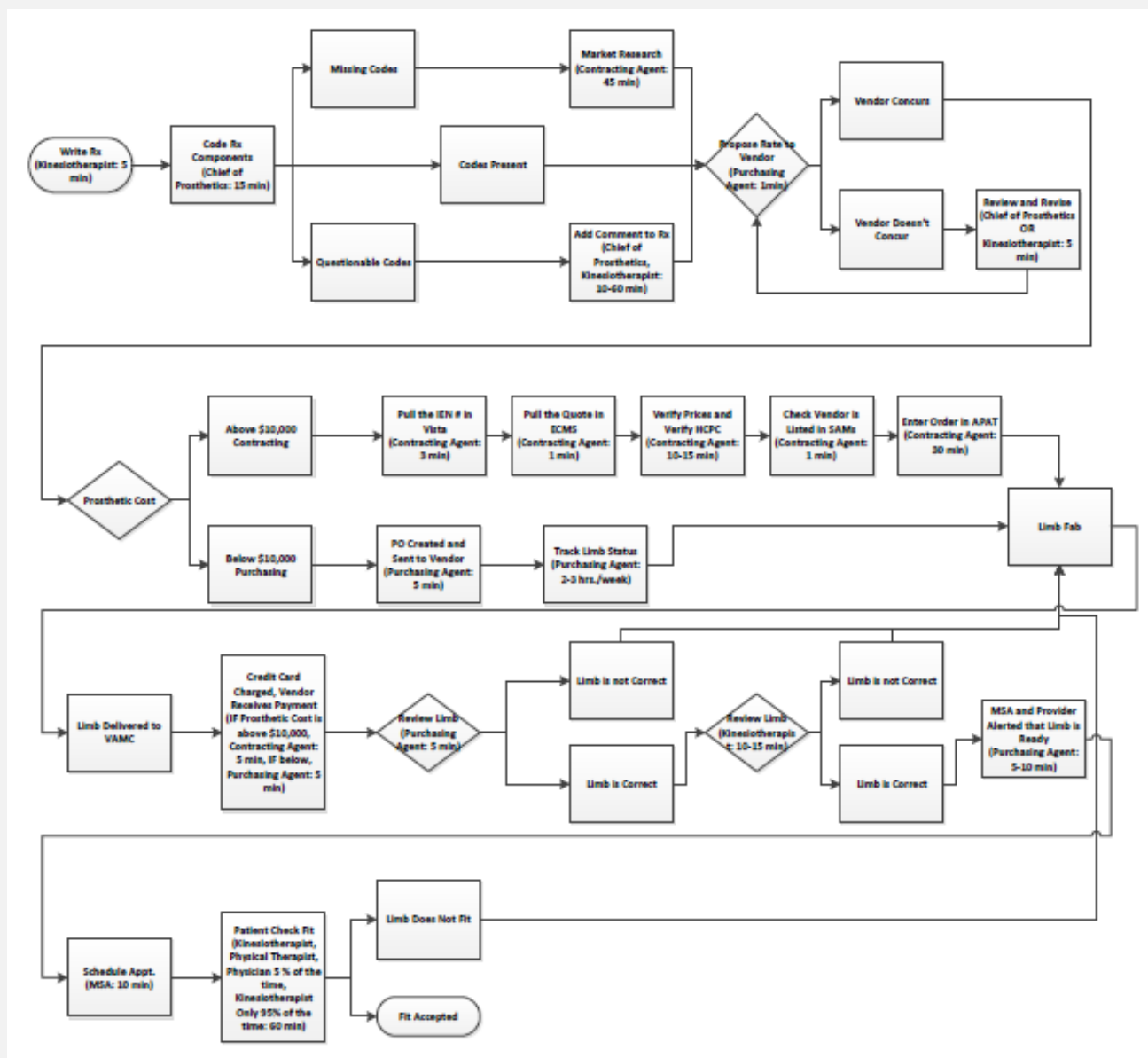


Figure 28. Mountain Home VA Fabrication Process Map.

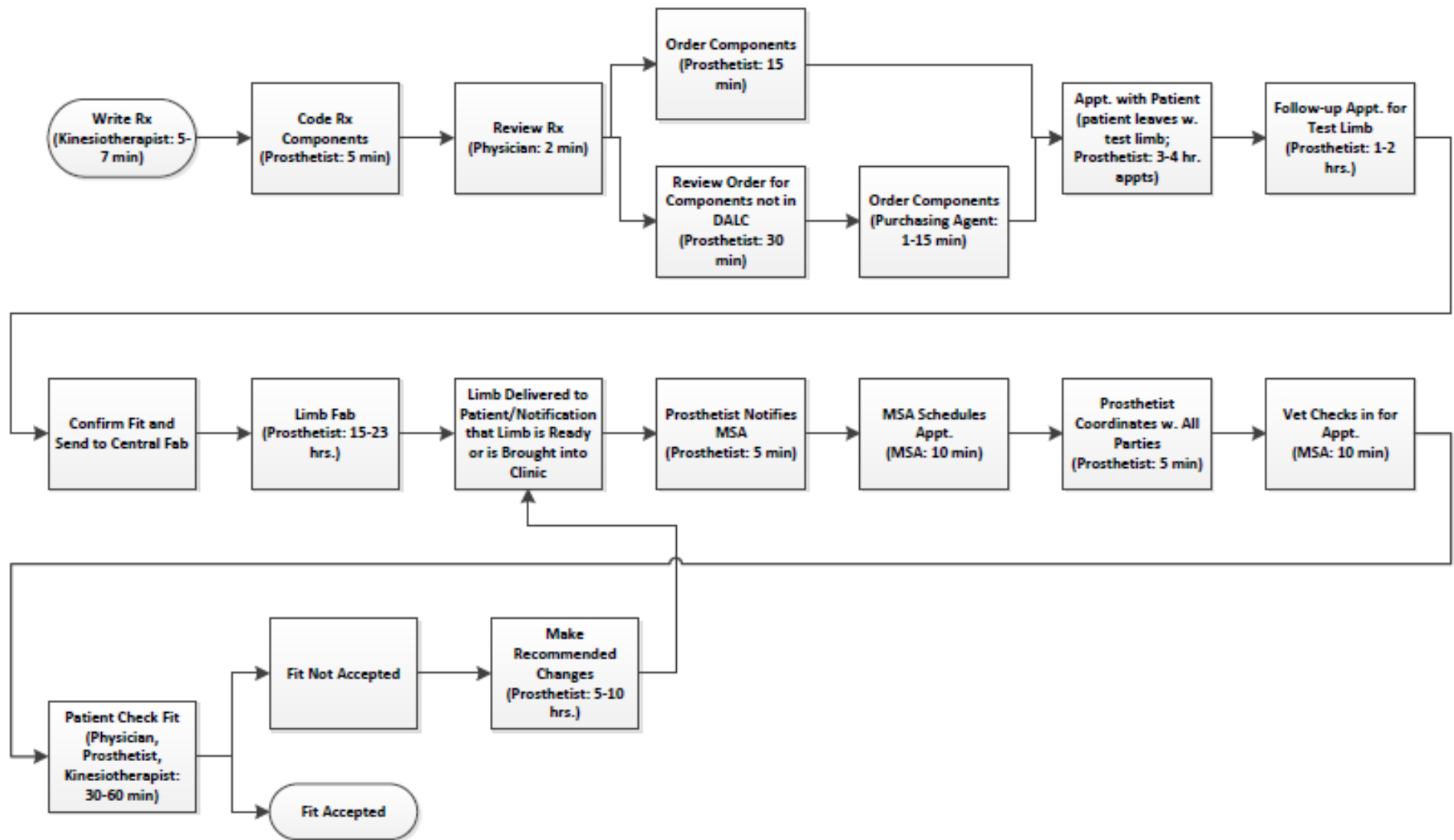


Figure 29. Murfreesboro VA Fabrication Process Map.

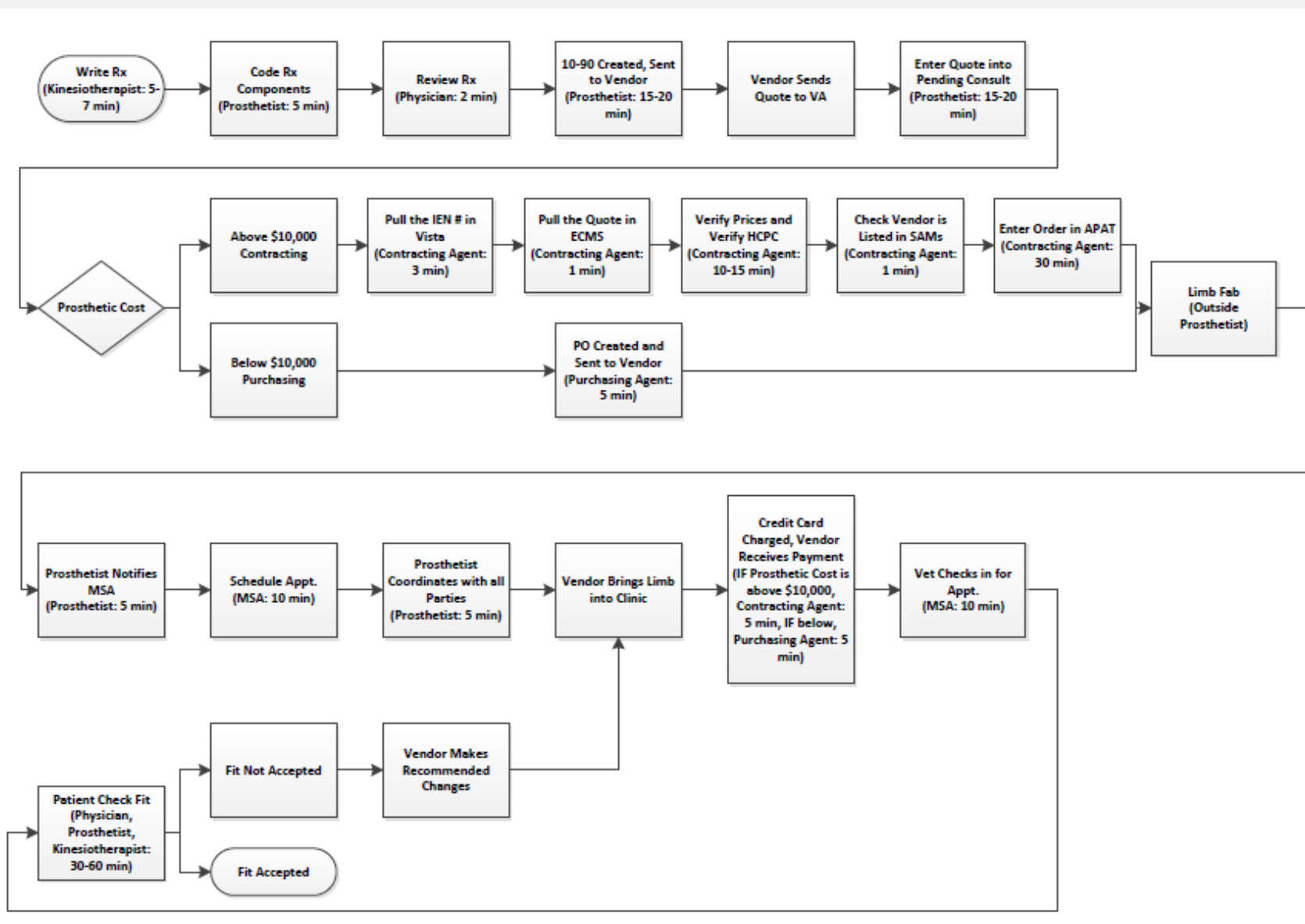


Figure 30. Murfreeboro Outside Vendor Process Map.