# Clinician and Staff Experiences with Electronic Health Record Modernization at Captain James A. Lovell Federal Health Care Center Chicago, IL

September 20, 2024

Prepared by: EMPIRIC QUERI Partnered Evaluation Initiative

MPIs:

Seppo Rinne, MD, PhD

Sarah Cutrona, MD, MPH

VA U.S. Department of Veterans Affairs

EMPIRIC QUERI
EHRM Partnership Integrating Rapid Cycle Evaluation to Improve Cerner Implementation

# TABLE OF CONTENTS


TABLE OF CONTENTS ..... 1

EXECUTIVE SUMMARY ..... 2

- KEY FINDINGS ..... 2
- RECOMMENDATIONS ..... 3

DETAILED REPORT ..... 5

- I. Introduction & background ..... 5
- II. Site context ..... 5
- III. Overview of EMPIRIC ..... 6
- IV. Methods ..... 6
- V. Quantitative Findings ..... 9
- Overall user experience with new EHR and perceptions of the transition ..... 10
- EHR usability and functionality ..... 16
- Communication about EHR issues and input on improving the EHR ..... 23
- Training and EHR support ..... 24
- NESSU ..... 28
- Patient Safety and Efficiency ..... 29
- Workarounds ..... 31
- VI. Qualitative Findings ..... 32
- Overall experience with the transition ..... 32
- EHR usability and functionality ..... 33
- Messaging and communication about the transition ..... 36
- Training and EHR Support ..... 38
- Clinic Capacity, Access, and Staffing ..... 42
- Perceived EHRM impact on Veterans ..... 44

CONCLUSION ..... 47

- RECOMMENDATIONS ..... 47

APPENDICES ..... 49

- I. Funding and Acknowledgements ..... 49
- II. Manuscripts based on the EMPIRIC evaluation ..... 49
- III. References ..... 50

# EXECUTIVE SUMMARY

This report presents experiences of electronic health record (EHR) users at the Captain James A. Lovell Federal Health Care Center, a joint Veterans Affairs/Department of Defense (VA/DoD) facility in Chicago, Illinois. Our report is based on longitudinal interviews and surveys during the transition to the new Oracle-Cerner EHR. These findings are part of a Quality Enhancement Research Initiative (QUERI) evaluation entitled "Electronic Health Record Modernization (EHRM) Partnership Integrating Rapid Cycle Evaluation to Improve Cerner Implementation" (EMPIRIC). For comparison, we present similar survey data collected over the same period from the Jesse Brown VA in Chicago, which did not undergo an EHR transition, as well as data collected at the Columbus VA before and after their transition to the Federal EHR.

**Overall, we found that EHR users at Lovell had difficulties with the new Federal EHR and reported issues with most aspects of the transition, including EHR usability, training and support, communication, and effect on patient safety. But the transition at Lovell was much less negative than what previous EHRM users had experienced.**

**KEY FINDINGS**

- **Overall experience**: User experience with the transition was much less negative than in prior transitions, and lessons from prior sites benefited FHCC Lovell immensely.
- **EHR usability and functionality**: Overall perceptions of the new EHR itself were varied. Relative to CPRS, the new Federal EHR was viewed less favorably, but the difference was much less negative than at prior sites. EHR users noted particular challenges with lab ordering, patient check-in and scheduling, and transitions of care.
- **Communication about the transition**: Despite an overwhelming volume of emails to users about the transition, important information about workflow changes was inconsistently communicated to local leaders and end users. Participants also noted insufficient service-specific guidance for planning the timing and duration of reduced clinic capacity ("ramp-down").
- **Training**: User perspectives about training, while improved relative to prior sites, continued to be negative. Users still reported that vendor-led training failed to prepare them for their specific roles and workflows, and noted major deficits in the scheduling and coordination of training. Relative to pre-go-live, fewer survey respondents at post-go-live reported receiving adequate training on the EHR and fewer reported access to training customized to their work area.
- **Responsiveness**: The proportion of users who reported timely resolution of EHR problems increased following go-live (as compared to a substantial decrease at prior sites), though many reported that achieving needed changes to the EHR was difficult because of the need for consensus across disparate entities beyond the facility.
- **Support**: Despite abundant support from several sources across VA, it remained challenging for users to obtain authoritative answers to difficult questions about the appropriate configuration and use of the new EHR.
- **NESSU:** The national EHRM supplemental staffing unit (NESSU) stood out as a highly valued source of peer support that filled important gaps in vendor-based training and helped maintain capacity during the transition. Over half of survey respondents received NESSU support, and the vast majority found NESSU to be helpful.
- **Efficiency:** Users found the new EHR less efficient and were more likely to report that they needed to enter the same data in multiple places, navigate numerous alerts/flags, spend time in the EHR after-hours, and rely on workarounds to complete necessary tasks. Where comparisons to prior transitions were available, reactions at FHCC Lovell were less negative than they had been at previous sites.
- **Safety**: Users were less likely to express confidence in the ability of the new EHR to help keep patients safe, though the drop in confidence was not as large as at previous sites.

- **Veteran Impact**: While participants observed some negative impacts on Veterans including increased wait times, challenges with the patient portal, and suboptimal clinical workflows, the impact appeared much less severe in comparison to prior transitions.

**Considerations when interpreting these findings:** Part of the reason that user experience at Lovell did not decline as a dramatically after the EHR transition (as compared to Columbus VA or other sites that have gone live), is that pre-go-live scores at Lovell were lower and therefore had less range to decline. Lovell also had a tremendous amount of national support and support from other centers; this level of support is most likely unsustainable as multiple sites simultaneously undergo EHRM.

**RECOMMENDATIONS**

*Leadership & communication*

- Connect future EHRM site leadership with engaged leaders at Lovell and other EHRM sites to **provide mentorship** on strategies and **access to playbooks** guiding successful implementation of the new EHR.
- Develop **additional planning resources** for site leaders, including communications plans for the EHR transition and guidance for planning appropriate ramp-down in each service.
- Consider cumulative burden on staff and use communication strategies that **help staff prioritize those meetings or messages that are most relevant to their roles.**
- Consider **exempting EHR transition sites from competing priorities** beyond direct patient care and normal site operations for a period of time before and after go-live. Sites may need this exemption for an extended duration as they adapt to the new system.
- Provide clear **guidance to sites about governance** of the new federal EHR and of the transition process to reduce conflicting messages and avoid ambiguity about who is responsible for which decisions.
- Provide clear **guidance about clinical policies and workflows changing** at the time of EHR transition, and recommended dissemination plans / implementation resources for these changes.
- Anticipate the impact of reduced schedules on Veterans, and **communicate with potentially affected Veterans early**, so that they understand the reasons for lower-than-typical appointment availability and other changes to Veteran experience related to the transition to the Federal EHR.

*Training*

- Bring more EHR training in-house and **clarify or amend contractual language that might constrain VA ownership of training.**
- **Ensure that training orients users to potential failure points**: i.e., steps in an EHR workflow which, if not A
- Provide more opportunities for **simulation-based learning**.
- Prioritize **improvements in the coordination and scheduling of training**, being mindful of users' clinical obligations.

*Support*

- **Reinforce peer support networks** that engage experienced users to disseminate lessons learned.
- **Destigmatize support-seeking** and promote effective adult learning by reinforcing **a culture of psychological safety.**
- Expand National EHRM Supplemental Staffing Unit **(NESSU) staffing and encourage end user participation in group and 1:1 sessions**.

*Continuous improvement*

- Conduct **systematic studies of "steady state" workflows to identify areas of reduced efficiency.** Insist upon EHR functionality that at least maintains prior efficiency levels, except where explicitly justified by measurable gains in other important outcomes (e.g., patient safety).
- Continue to **evaluate the user experience at future go-live sites** and consider the benefits of providing users with opportunities to share their perspectives and make their voices heard.

Our recommendations for improving the VA's EHRM were developed through a comprehensive analysis of survey and qualitative findings, coupled with insights from prior evaluations and relevant literature. By integrating these diverse sources of data, we strove to present recommendations that are both evidence-based and aligned with current best practices for EHR transitions.

# DETAILED REPORT

### I. Introduction & background

VA's EHRM is the largest EHR transition globally; other systems' transition experiences inform what we know about these processes:

*All EHR transitions are challenging.*

- Frontline clinicians often struggle with EHR-to-EHR transitions.[1]
- Disruptions to patient care and employee use can persist for years after shifting to a new EHR.[2-4]
- Transitioning from a homegrown EHR to a commercial EHR may be particularly challenging;[5] in contrast to commercial systems, homegrown EHRs are designed for specific health systems' needs.[6]

*VA is a unique environment with distinct EHR transition challenges.*

- VA's EHR, VistA/CPRS (hereafter "CPRS") is one of the oldest homegrown EHRs in the country. CPRS has been consistently ranked highly by frontline clinicians,[7] which may result in more resistance to change.
- Whereas each VA Medical Center can customize CPRS to meet local end users' needs, Oracle-Cerner (hereafter "the new Federal EHR") is more difficult to adapt to meet local needs.

### II. Site context

*General site features*

- Captain James A. Lovell Federal Health Care Center (FHCC) (Station 556 in VISN 12) is VA's 6th EHRM site and is located in North Chicago, Illinois.
- It serves approximately 80,000 eligible military and retiree beneficiaries annually. [1]
- Lovell is the first partnership between the U.S. Department of Veterans Affairs (VHA) and the Department of Defense and was established Oct 1, 2010.
- Lovell went live with the new Federal EHR in March 2024 and was the sole exception to VA's April 21, 2023 EHR rollout halt.[2]
- EHRM change management at previous sites was primarily led by VA and Oracle Health. New third party contracting services also supported EHRM change management at the Lovell FHCC.
- The Lovell FHCC consists of three locations: West Campus (offering a full spectrum of services), East Campus (consisting of four branch medical clinics for U.S. Navy military members and recruits), and three Community Based Outpatient Clinics (CBOCs).[3],[4]
- Lovell FHCC has 3,200 combined VA-Navy staff and a 300 bed Hospital/CLC/residential capacity. This includes 10 ICU beds, 34 Medical Surgery beds, 32 Acute Inpatient Psychiatry beds.[1]
- Lovell FHCC provides both inpatient and outpatient care, with primary care, medical and surgical capabilities, acute and long-term mental health care, extended care services, and physical medicine and rehabilitation programs.
- As an FHCC, Lovell provides full medical and surgical care, including cardiology, pulmonary, and neurology, mental health services (acute and long-term care, post-traumatic stress disorder, homeless domiciliary care, alcohol/drug rehab, etc.), and a Community Living Center.

[1] Captain James A. Lovell Federal Health Care Center: At a Glance. *Health.mil*. Reference Center Presentation. Aug 10, 2022.
[2] STATEMENT OF NEIL EVANS
[3] Evanston, Illinois; Kenosha, Wisconsin; McHenry, Illinois
[4] Capt. James A. Lovell FHCC - VISN 12 - VA Great Lakes Health Care System

**III. Overview of EMPIRIC**

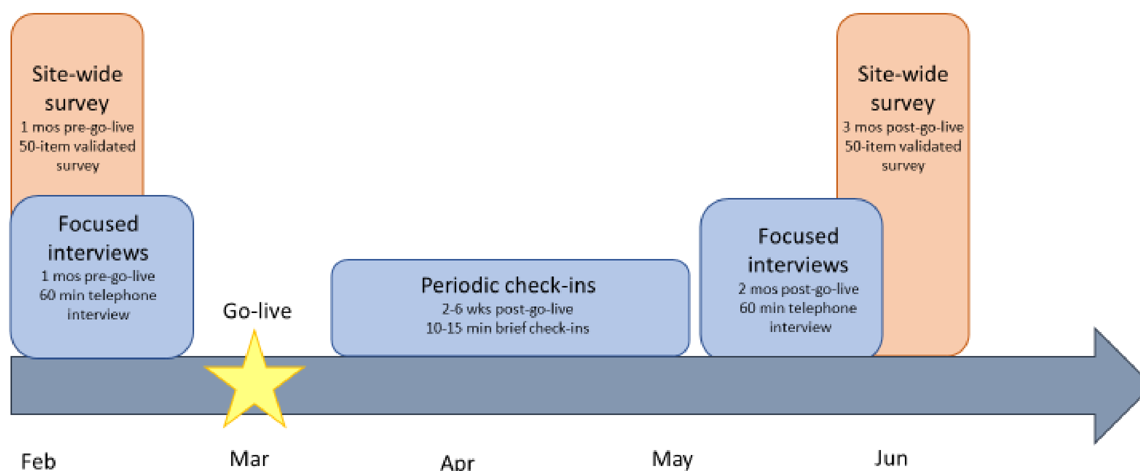
"**E**HR**M** **P**artnership **I**ntegrating **R**apid Cycle Evaluation to **I**mprove **C**erner Implementation (EMPIRIC)" (VA QUERI PEC 20-168) is a VA Quality Enhancement Research Initiative (QUERI) funded Partnered Evaluation Initiative designed to improve EHR Modernization by identifying challenges and best practices to support clinicians on-the-ground while informing the nationwide EHR rollout. [Quality Enhancement Research Initiative (QUERI) (va.gov)]

We have already conducted detailed evaluations of clinician and staff experiences at the Mann-Grandstaff VAMC in Spokane, WA (the first VA EHR Modernization site), and the Chalmers P Wylie Veterans Outpatient Clinic in Columbus, Ohio, the findings of which comprise separate reports. **This report builds upon our prior evaluation experiences and presents findings from a formative evaluation of Lovell FHCC frontline clinicians and staff across the go-live and subsequent months.**

Approach: We conducted a formative mixed-methods evaluation using quantitative and qualitative approaches to understand frontline clinician and staff experiences at initial EHR Modernization sites. For quantitative findings, we provide comparisons to (a) a contemporary non-EHR Modernization site (Jesse Brown VAMC, on CPRS) and (b) an historical EHR Modernization site (Columbus, OH, which underwent go-live on April 30, 2022).

**IV. Methods**

We used concurrent mixed methods (quantitative and qualitative) to evaluate end-user experience at three points during the transition to the new Federal EHR: the month before go-live (interviews and surveys), during go-live (brief check-in interviews), 2 months post go-live (interviews) and 3 months post-go-live (surveys) (Figure 1). As detailed below, we also assessed EHR experiences at a non-EHR Modernization site over the same time period.



### *Quantitative*

We conducted surveys with Lovell FHCC personnel before and after the Federal EHR go-live on March 9, 2024 to measure EHR use, effects of EHR transition on patients and staff, and factors that might influence EHR implementation. FHCC employees were identified from VA Corporate Data Warehouse staffing files. Unique survey links were generated for each employee and sent to their VA email. Non-respondents were sent up to three reminders. Surveys were voluntary, and respondents could choose not to participate; could decline to respond to any given item; and could abandon the survey at any time. To provide a point of comparison, surveys were sent concurrently to employees at Jesse Brown VA Medical Center in Chicago, Illinois, using the same survey methods as for Lovell FHCC. As of the date of this report, Jesse Brown VAMC has not yet begun to transition their EHR and has been using the same EHR (CPRS) throughout the survey period.

Lovell and Jesse Brown response rates used individually identifiable survey links. Numerator for response rates was calculated based on the number of individuals who responded to the first survey question. Denominator for response rates was based on site designation from staffing data (i.e., individuals were assigned to a site based on human resources data). For the purposes of reporting results, site designation was based on self-reported identification of a primary site (i.e., individuals identified their site in response to a survey question). Response rates were as follows:

- Pre-Go Live surveys were conducted from February 7 to March 1, 2024.
  - Lovell: 637/ 2,489 = 25.6%
  - Jesse Brown: 933/4,474 = 20.9%
- Post-Go Live surveys were conducted from June 13 to July 5, 2024.
  - Lovell: 537 / 2,791 = 19.2%
  - Jesse Brown: 631/ 5,324 = 11.9%

Where available, we also present survey results from a previously reported evaluation of EHR user experience before and after the Columbus, Ohio VA went live with the new Federal EHR. These data were collected at similar points in time to Lovell, 1-month pre-go-live and 3 months post-go-live. Surveys were distributed to Columbus employees using a non-personalized survey link distributed via facility mail lists. There were an estimated 1,500 employees on the mail list, and 408 surveys were returned at pre-go-live (approximately 27%) and 458 at post-go-live (approximately 31%). The composition of the surveys fielded to the Columbus VA were nearly identical to those fielded to Lovell and Jesse Brown.

#### *Survey content*

Surveys included three broad domains:

- Factors that could influence how well or poorly Lovell was able to **implement the new Federal EHR,** e.g., measures of EHR training, workflow, support and communication (14 items).
- Measures related to proficiency and time spent in the EHR (1 items) and **EHR usability**, e.g., ease of use and confidence using the EHR (16 items).
- Measures of **employee and patient factors** potentially impacted by the EHR transition, including the effect of the EHR on patient safety (1 item), impact of the EHR on health-profession trainees (2 items), job satisfaction and burnout (8 items).

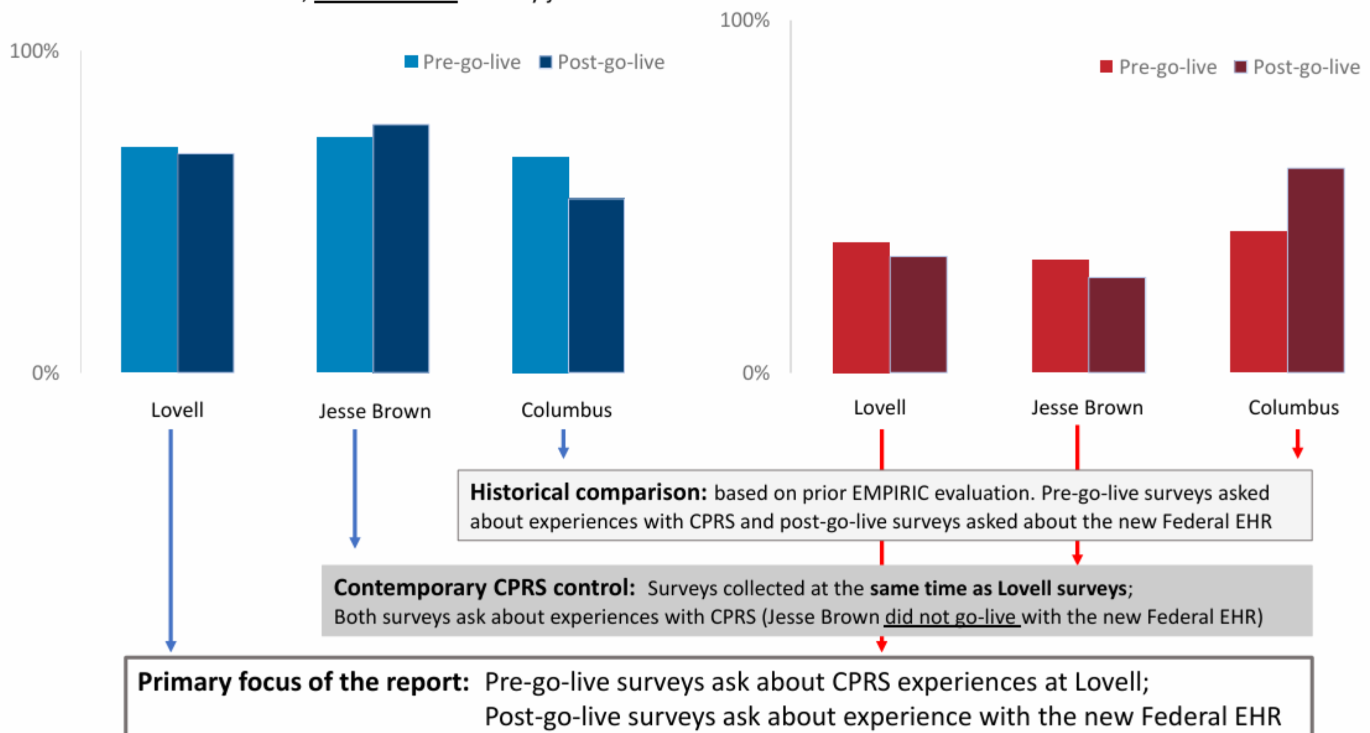
Survey questions included published, validated measures as well as questions developed by the evaluation team. Study surveys are available upon request. In total, 1-month pre-go-live surveys and 3-month post-go-live surveys comprised 42 items, excluding respondent demographic and work-role questions. Most survey items were repeated, with minor revisions made to some measures to compare respondents' perceptions of CPRS to the new Federal EHR at pre-go-live versus post-go-live. Surveys also included three open-text items, results of which were not included in this report.

*Data Presentation*

Survey data are presented as bar graphs comparing measures from 1-month pre-go-live to 3-month-post-go-live for Lovell FHCC; at 1-month pre-go-live, Lovell respondents were asked about their experience with CPRS/Vista and at 3-month-post-go-live they were asked the same questions about their experience with the new Federal EHR. Additionally, we present findings from the same time period for respondents at the Jesse Brown VAMC, who were asked about their experience with CPRS/Vista at both time points. Finally, we present results from a prior set of surveys conducted at the Columbus VA in 2022; as with the Lovell survey, participants at the Columbus VA had been surveyed approximately 1-month pre-go-live (March - April, 2022) about their experience with CPRS/Vista, and were asked the same questions about their experience with the new Federal EHR approximately 3-months post-go live (July - August, 2022).

For most measures, we present the proportion of survey respondents who selected the top-two affirmative response options (for example, "agree or strongly agree"). We used this display for visual simplicity because it facilitates comparing survey results from Lovell FHCC, Jesse Brown VA, and Columbus VA in the same graph. We report results for respondents who indicated that they use the EHR for their work and omitted responses that had missing values or where the respondent selected not applicable. Survey item wording in the bar graphs has been abbreviated to improve readability.

Some survey items were framed positively (e.g., "overall, I am satisfied with the EHR") and some were framed negatively (e.g., "I feel a great deal of stress because of the EHR"). This changes the implications of having a large proportion of participants agreeing or strongly agreeing. In order to make it easier to differentiate between graphs depicting positively framed vs. negatively framed items, we used blue hues to indicate graphs for positively-framed items and red hues to indicate negatively-framed items. (See example figures below for details on data presentation on report charts.)



*Qualitative*

The presented findings reflect a combination of deductive and inductive content analysis[8] of pre- and post-go live qualitative data. We collected qualitative data from clinicians, nurses, support staff, and clinical administrators and leaders at FHCC by conducting pre-go-live interviews (30-60 minutes) 1 month prior to go-live and post-go-live interviews 2 months after go-live (Table 1). We first interviewed clinical administrators and leaders before go-live about their experiences with EHRM and asked them to identify additional contacts for interviews. Those contacts who participated in interviews were also asked to refer additional contacts iteratively until we had enough participants to address the recruitment needs of our evaluation aim. We also conducted brief check-in interviews (10-15 minutes) approximately 3-4 weeks after go-live to understand participants' real-time experiences of EHRM. Although the check-in data were not analyzed separately for this report, they informed our interpretations of interview findings.

**Table 1.** EMPIRIC interviews at FHCC

| | 1-month pre-go-live interviews | Check-ins | 2-month post-go-live interviews | Total |
|---|---|---|---|---|
| Providers* | 13 | 10 | 11 | **34** |
| Nurses** | 8 | 7 | 7 | **22** |
| Staff*** | 2 | 2 | 2 | **6** |
| **Total** | **23** | **19** | **20** | **62** |

*MDs, PharmDs, PAs, APRNs, Psychologists; **RNs and LPNs; *** MSAs and allied health professionals

We completed a total of 23 1-month pre-go-live interviews, 19 brief check-in interviews, and 20 2-month post-go-live interviews with 24 unique participants between February 2024 and May 2024. Ten of these participants held supervisory or leadership positions, and 14 were end users without supervisory responsibilities.

All interviews were conducted virtually. Interviews were recorded and transcribed. We performed deductive content analysis relating to categories of interest, as well as inductive analyses to identify emergent findings. These findings were iteratively reviewed, revised, and refined by our interdisciplinary team to determine categories and sub-categories of interest for this report.

*Quote presentation*

Selected exemplar quotes from interviews are included in the following sections to illustrate key concepts, variation in the data for each finding, and a sense of the range of clinician and staff experiences at FHCC. Each quote includes an identification code and reference to the research wave: "pre" to refer to 1-month pre-go-live and "post" for 2-month post-go-live.

## V. Quantitative Findings

We have organized our findings in five categories based on survey content and areas importance to operational partners. These are:

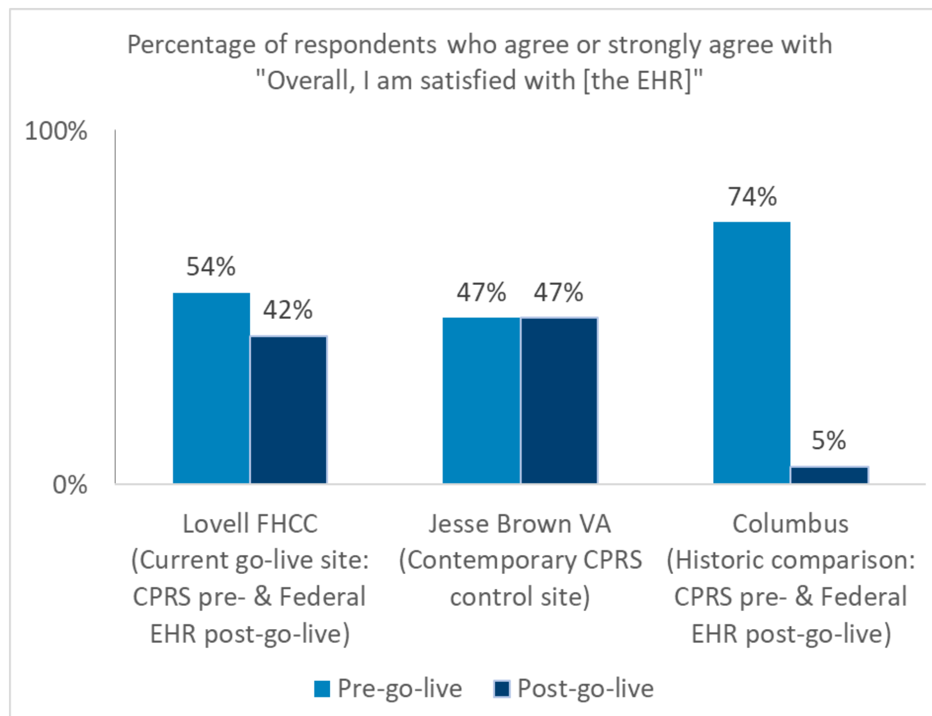
1. Overall user experience with the new EHR and perceptions of the transition
2. EHR usability and functionality
3. Communication about EHR issues and input on improving the EHR
4. Training and EHR support
5. Patient safety and efficiency

A common pattern is observed across most items, with a few potentially important exceptions. The pattern is that there is a moderate worsening of respondent ratings of the EHR from pre-go-live when they are rating CPRS to post-go-live when they are rating the Federal EHR. In contrast, respondent ratings at Columbus VA worsened profoundly over the equivalent time frame during their transition in 2022. The equivalent pre-go-live ratings (i.e., ratings of CPRS) at Columbus VA were generally modestly more favorable than the same pre-go-live ratings at Lovell FHCC; this difference could be due to temporal trends, or to regional differences in experiences with the EHR. Ratings of CPRS-user experience at the Jesse Brown VA collected at the same time points as the Lovell pre-go-live and post-go-live surveys were very similar to the Lovell FHCC pre-go-live ratings suggesting that Lovell's pre-go-live ratings of CPRS were not simply a function of Lovell FHCC being a joint VA-DoD facility. This highlights the importance of collecting data from contemporary control sites not undergoing the transition to the new Federal EHR.

### *Overall user experience with new EHR and perceptions of the transition*

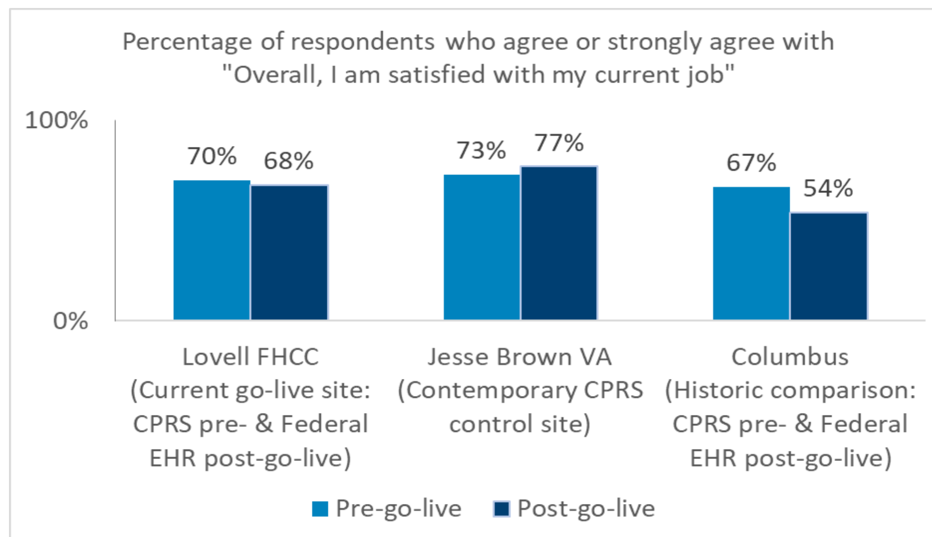
Satisfaction with the EHR declined moderately at Lovell (Figure 2), with 54% of pre-go-live respondents agreeing or strongly agreeing that overall, they were satisfied with CPRS and 42% of post-go-live respondents agreeing or strongly agreeing that they were satisfied with the Federal EHR. The proportion of respondents at Jesse Brown satisfied with CPRS was unchanged (47%) over this same period. The modest decline in satisfaction after going live with the Federal EHR was in stark contrast to the profound drop in satisfaction observed at the Columbus VA over an equivalent period post go-live (74% satisfaction with CPRS at 1-month pre-go-live and 5% satisfaction with the Federal EHR at 3-months post-go-live).

**Figure 2.** Overall EHR satisfaction



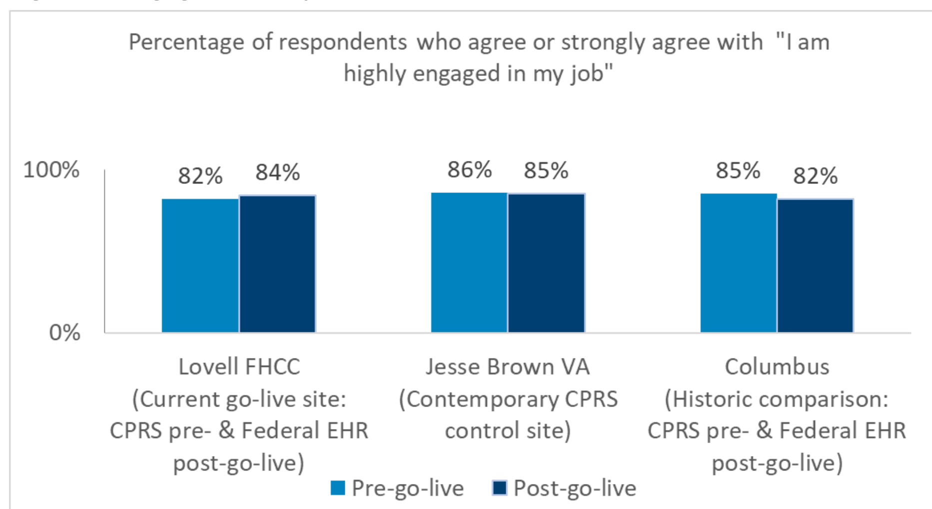
Overall job satisfaction was largely unchanged at the Lovell FHCC (Figure 3). At pre-go-live at Lovell, 70% of respondents agreed or strongly agree that they were satisfied with their current job, which was relatively unchanged 68% at post-go-live. Over the same period at Jesse Brown, there was a slight increase from 73% to 77%. At the Columbus VA, 67% at pre-go-live agreed or strongly agree that they were satisfied with their current job, which decreased to 54% at post-go-live.

**Figure 3**. Overall job satisfaction



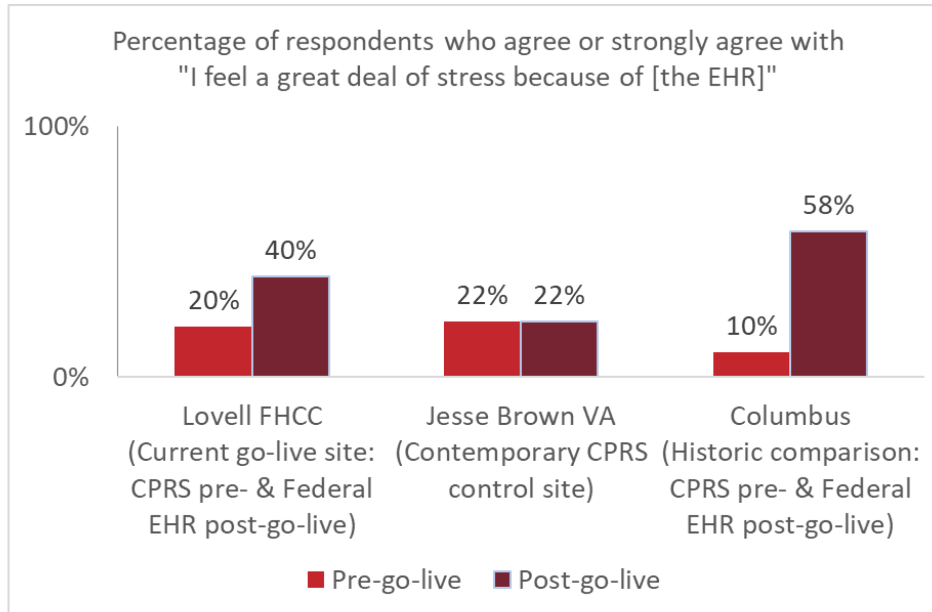

Respondents reported high job engagement across sites and over time (Figure 4). At pre-go-live at Lovell FHCC, 82% of respondents agreed or strongly agreed that they were highly engaged in their job, which increased slightly to 84% post go live. Engagement at the Jesse Brown VA was unchanged over the same period with 86% agreeing or strongly agreeing that they were highly engaged in their job at baseline and 85% agreeing or strongly agreeing at follow-up. Respondents at the Columbus VA had also demonstrated high engagement, with 85% agreeing or strongly agreeing that they were highly engaged in their job at pre-go-live and 82% at post-go-live.

**Figure 4.** Engagement in job



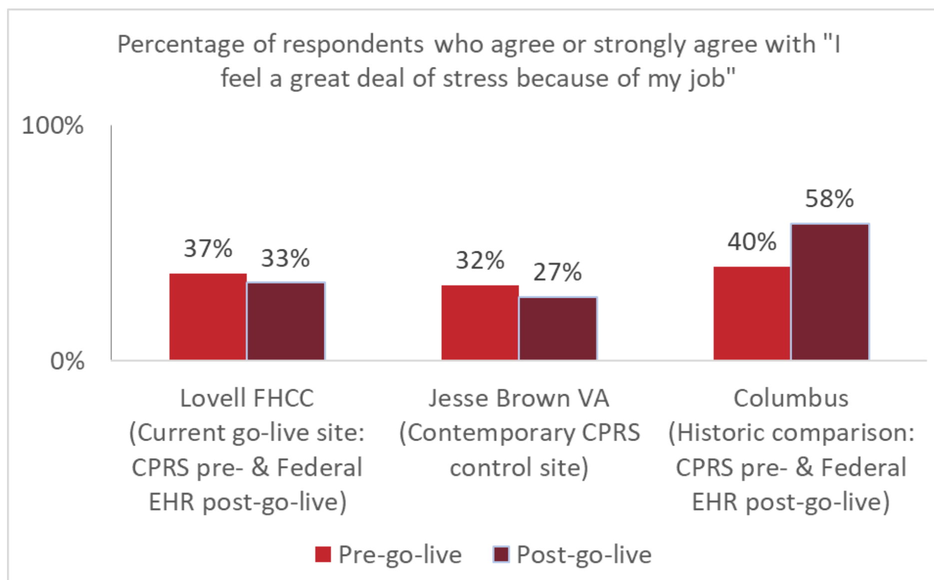
There was an increase in stress due to the EHR at Lovell FHCC, but this increase in stress was less profound than the change observed at the Columbus VA after their go-live (Figure 5). At pre-go-live in Lovell FHCC, 20% of respondents agreed or strongly agreed that they felt a great deal of stress because the EHR, which increased to 40% at post go live. Over the same period, stress because of the EHR at Jesse Brown was unchanged at 22%. In contrast, there had been a more notable increase in stress at Columbus VA, with 10% agreeing or strongly agreeing that they felt a great deal of stress due to the EHR at pre-go-live and 58% at post-go-live.

**Figure 5.** Stress due to EHR




Job-related stress decreased at Lovell and Jesse Brown, while it had increased at Columbus (Figure 6). In Lovell FHCC at pre-go-live, 37% of respondents agreed or strongly agreed that they felt a great deal of stress because of their job, which decreased slightly to 33% at post-go-live. At the Jesse Brown VA, 32% agreed or strongly agreed at baseline they felt a

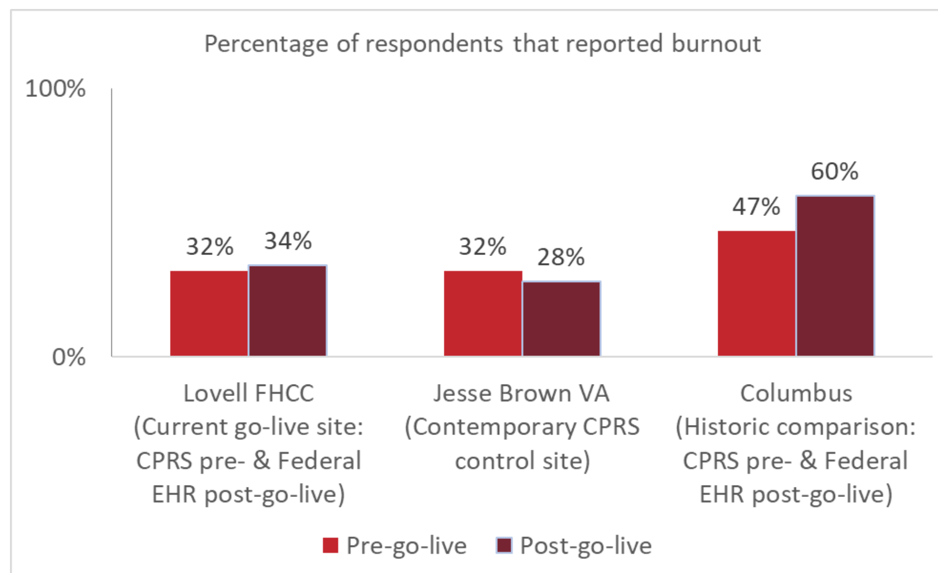
**Figure 6.** Job-related stress



great deal of stress because of their job, and this decreased slightly to 27% at follow up. At Columbus 40% of survey respondents agreed or strongly agreed that they felt a great deal of stress because of their job at pre-go-live, versus 58% at post-go-live.

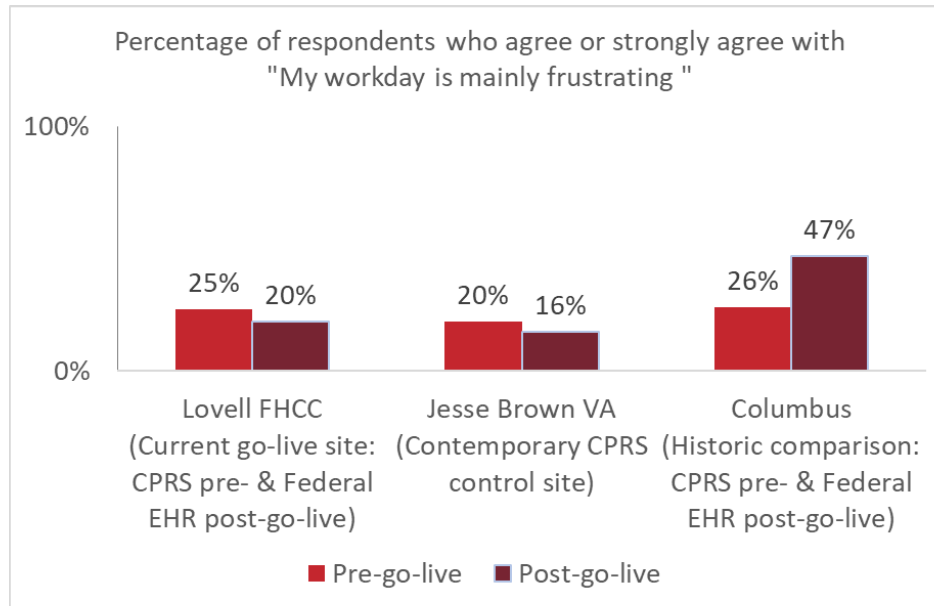
Burnout was relatively unchanged at Lovell and decreased slightly at Jesse Brown, while it had increased moderately at Columbus (Figure 7). At pre-go-live in Lovell FHCC, 32% of respondents screened positive for burnout, which was relatively unchanged at 34% during post-go-live. At the Jesse Brown VA, burnout decreased from 32% to 28% over the same period. There was notable increase in burnout at Columbus, where 47% screening positive for burnout pre-go-live, versus 60% at post-go-live.

**Figure 7.** Work-related burnout



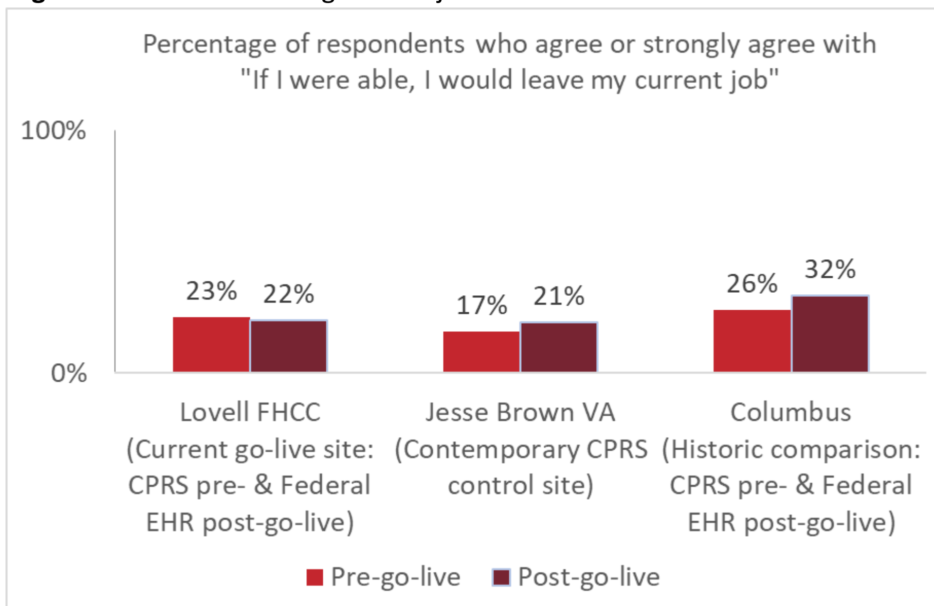
Experiencing one's workday as frustrating decreased slightly at Lovell and Jesse Brown, while it had increased at Columbus (Figure 8). At pre-go-live at Lovell FHCC, 25% of respondents agreed or strongly agreed that their workday was mainly frustrating, which decreased to 20% at post go live. At the Jesse Brown VA, 20% agreed or strongly agreed that their workday was mainly frustrating at baseline, and this decreased to 16% at follow-up. In contrast, 26% survey respondents at Columbus agreed or strongly agreed that that their workday was mainly frustrating at pre-go-live, versus 47% at post-go-live.

**Figure 8**. Frustration with workday




Survey respondents' desire to leave their current job was largely unchanged at Lovell and Jesse Brown, while it may have increased slightly at Columbus (Figure 9). At pre-go-live at Lovell FHCC, 23% of respondents agreed or strongly agreed that they would leave their current job if they were able, which decreased to 22% at post go live. At the Jesse Brown VA, 17% agreed or strongly agreed at baseline that they would leave their current job if they were able, and this increased to

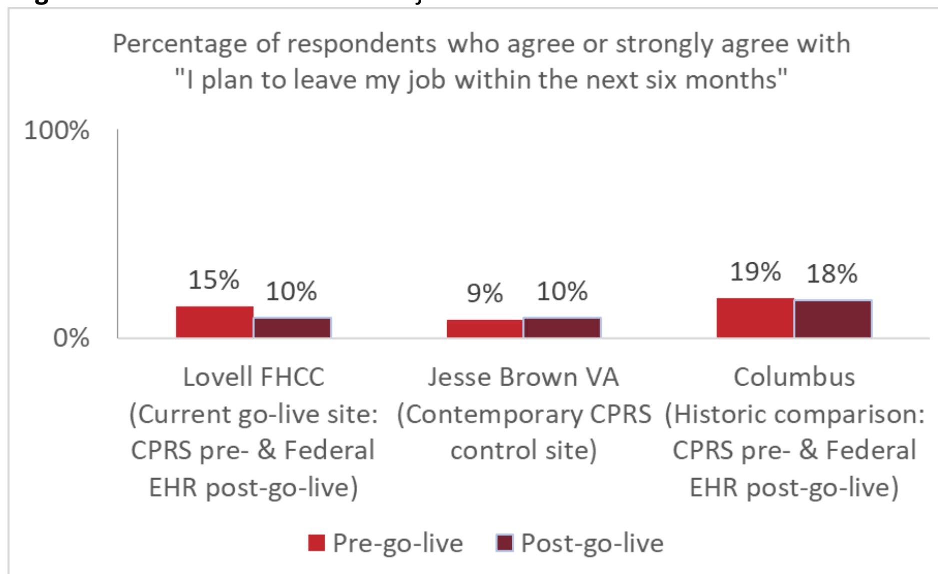
**Figure 9**. Interest in leaving current job



21% at follow-up. In Columbus, 26% of survey respondents agreed or strongly agreed that they would leave their current job if they were able at pre-go-live, versus 32% at post-go-live.

The proportion of respondents who planned to leave their job in the next six months decreased slightly at Lovell FHCC following go-live while it was largely unchanged at Jesse Brown over the same period and had been largely unchanged at Columbus following go-live (Figure 10). At pre-go-live at Lovell FHCC, 15% of respondents agreed or strongly agreed that plan to leave their job in the next six months, which decreased to 10% at post go live. Over the same period, responses at the Jesse Brown VA were largely unchanged, with 9% reporting they plan to leave their job at baseline versus 10% at follow up. At Columbus 19% agreed or strongly agreed that plan to leave their job in the next six months at pre-go-live, versus 18% at post-go-live.

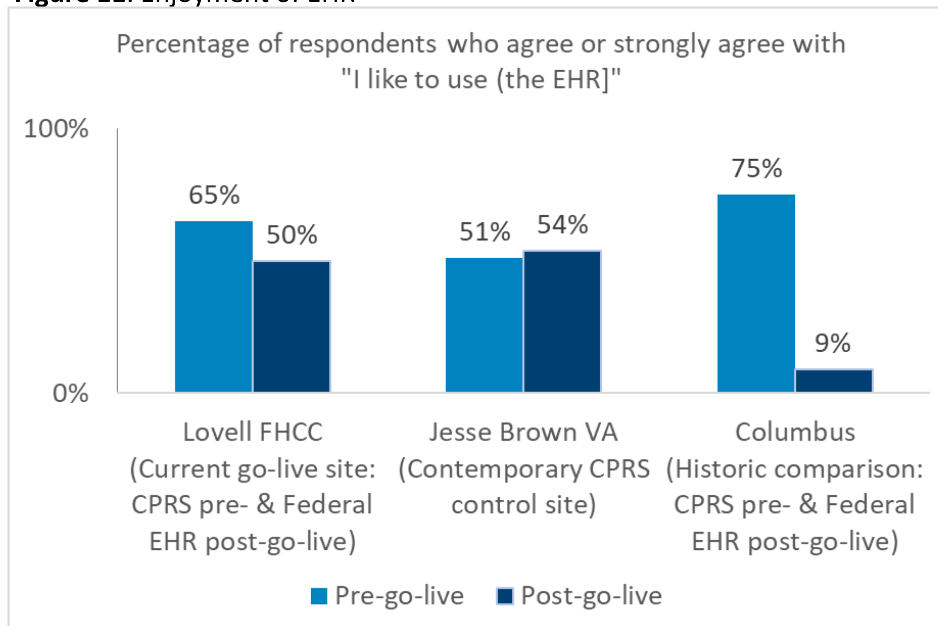
**Figure 10**. Intent to leave current job



### *EHR usability and functionality*

Across most measures of EHR usability and functionality, there were moderate decreases in the proportion of respondents at the Lovell FHCC who reported favorable scores for the EHR following go-live, while the same scores were largely unchanged at the Jesse Brown VA over the same period. The decreased EHR usability among respondents at Lovell FHCC following go-live was much less dramatic than declines in EHR usability at the Columbus VA following go-live. At pre-go-live at Lovell FHCC, 65% of respondents agreed or strongly agreed that they liked to use CPRS, which decreased post-go-live with 50% agreeing or strongly agreeing that they liked using the Federal EHR (Figure 11). At the Jesse Brown VA, 51% agreed or strongly agreed they liked to use CPRS at baseline versus 54% of survey respondents who agreed or strongly agreed at follow-up. In Columbus, 75% of survey respondents agreed or strongly agreed that they liked to use CPRS at pre-go-live, versus 9% of survey respondents who agreed or strongly agreed that they liked to use the Federal EHR at post-go-live.

**Figure 11**. Enjoyment of EHR



Other aspects of system usability followed a similar pattern, with perceived system usability decreasing at Lovell FHCC following go-live while changing little at Jesse Brown over the same period and having experienced a more profound decrease at the Columbus VA following go-live in 2022. Relevant system usability items included the following statements: (1) the EHR is easy to use (Figure 12); (2) various functions of the EHR are well-integrated (Figure 13); most people in my specialty would learn to use the EHR quickly (Figure 14, pg 19); and I am very confident using the EHR (Figure 15, pg 19).

**Figure 12**. EHR ease of use

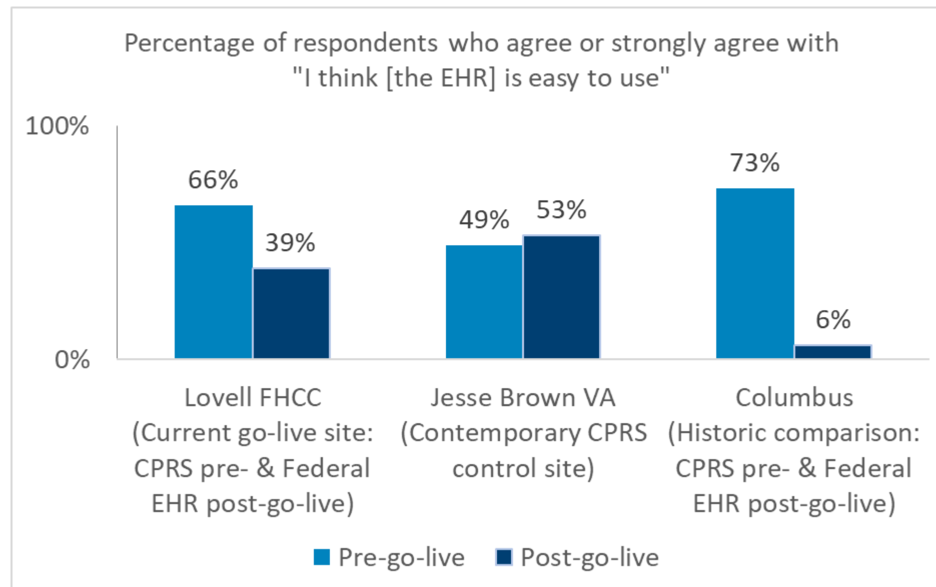



**Figure 13**. Finding that EHR functions are well-integrated

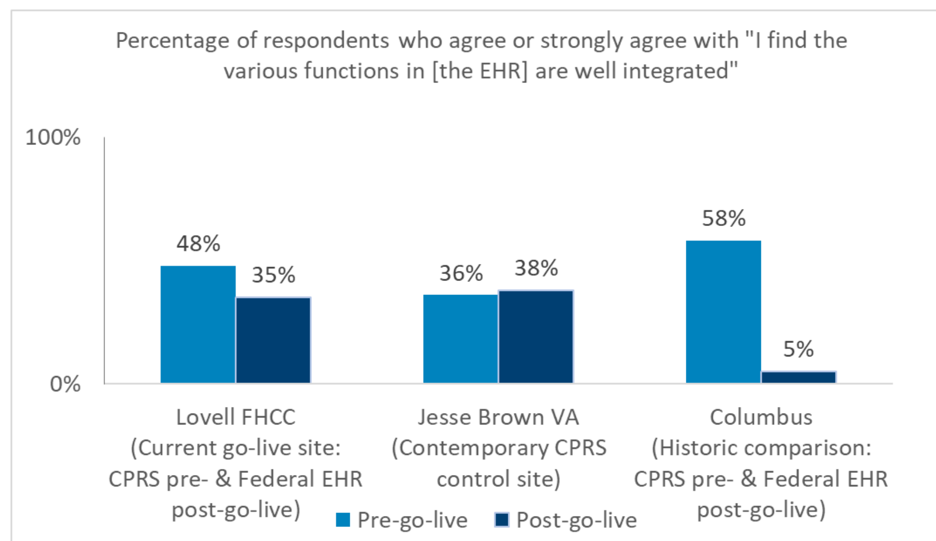


**Figure 14**. Belief that others in their specialty could quickly learn to use EHR

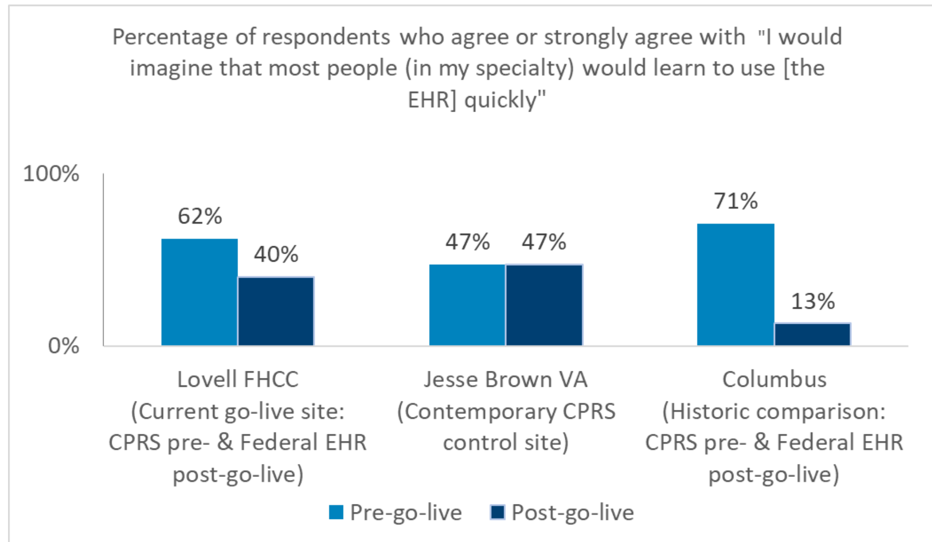
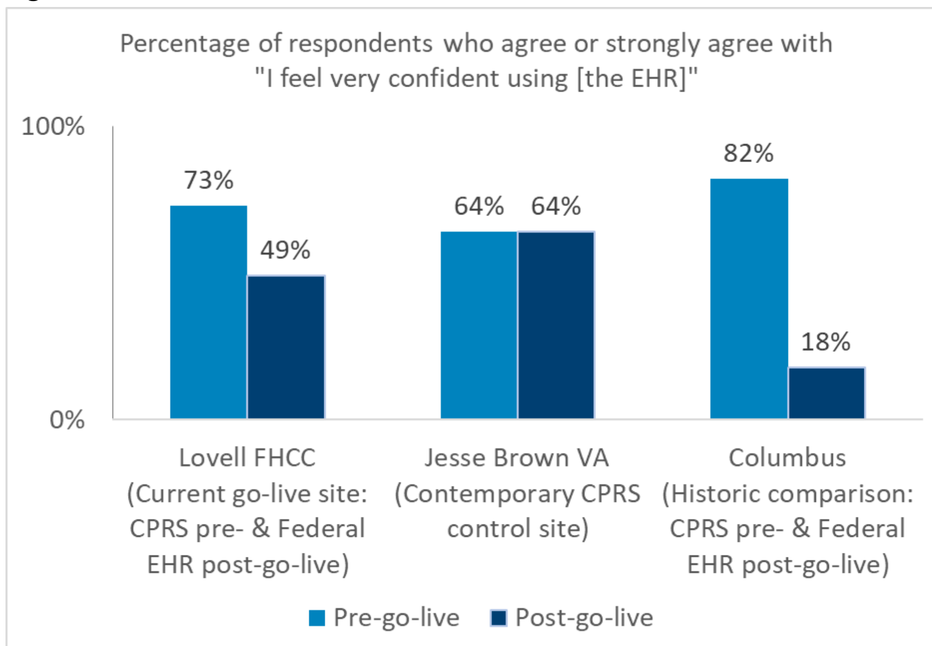



**Figure 15**. Confidence in use of EHR



Survey items with negative framing of system usability exhibited the inverse pattern compared to the items with positive framing. In this case, the proportion of respondents agreeing or strongly agreeing to items about poor usability increased at Lovell FHCC following go-live while changing little at Jesse Brown over the same period, whereas a profound increase in these items with negative framing had been observed at the Columbus VA following go-live in 2022. Relevant system usability items with negative framing included the following statements: (1) the EHR is unnecessarily complex (Figure 16); (2) I would need the support of technical personnel to use the EHR better (Figure 17, pg 21); (3) there is too much inconsistency in the EHR (Figure 18, pg 21); (4) the EHR is very cumbersome to use (Figure 19, pg 22); and (5) I need to learn a lot of things before I could get going with the EHR (Figure 20, pg 22).

**Figure 16**. Finding that EHR is unnecessarily complex

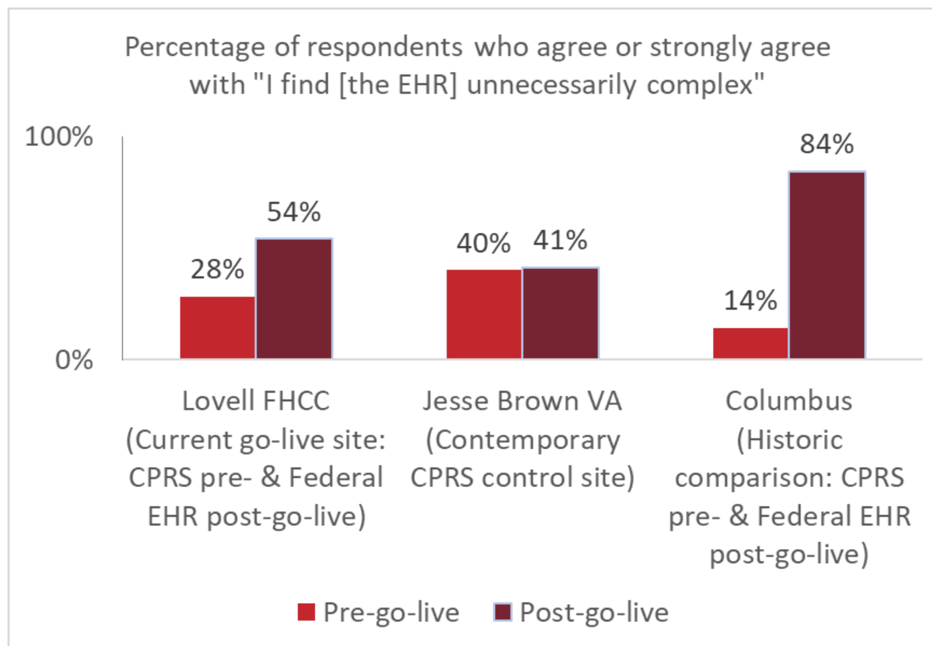


**Figure 17**. Perception of need for technical help to improve EHR use

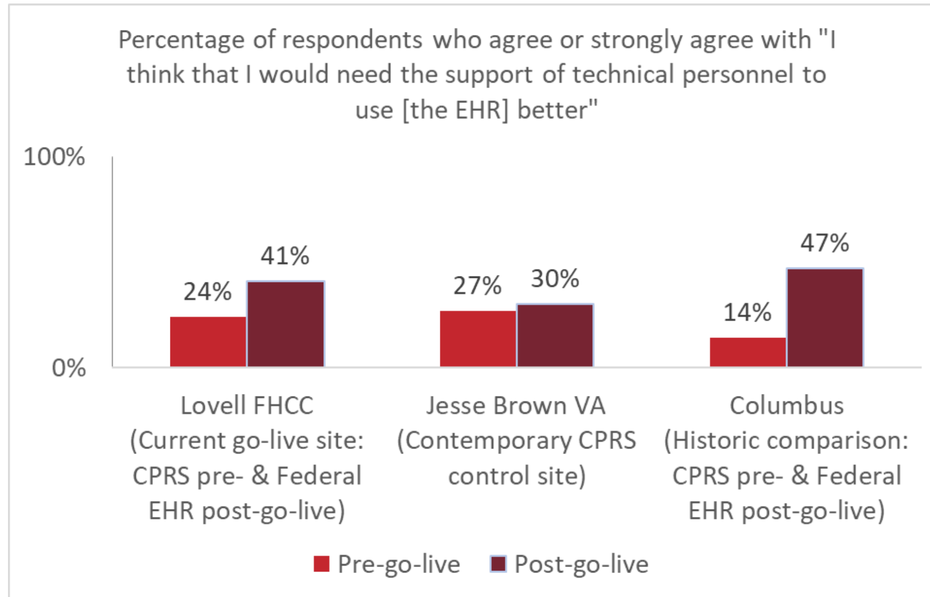



**Figure 18**. EHR inconsistency

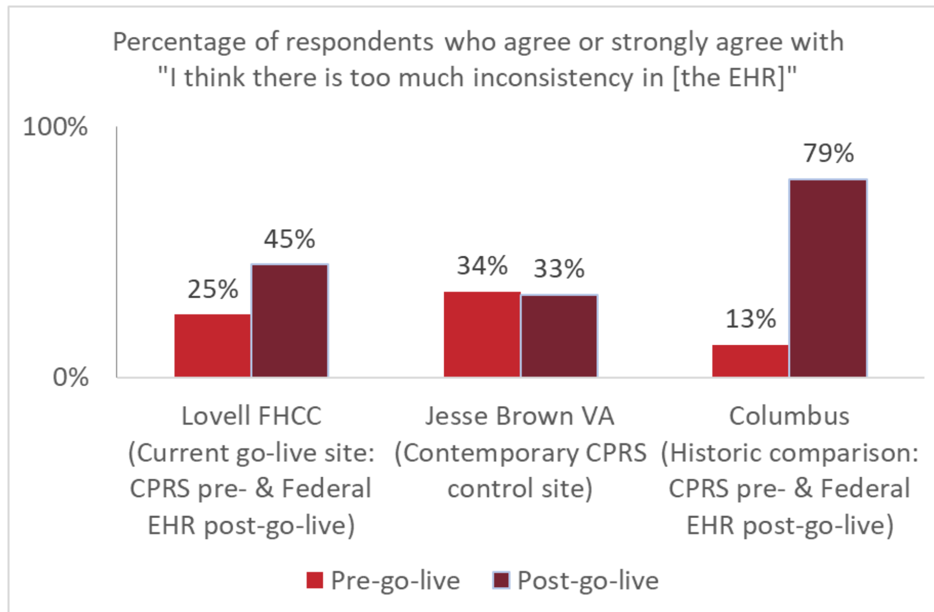


**Figure 19**. EHR cumbersome

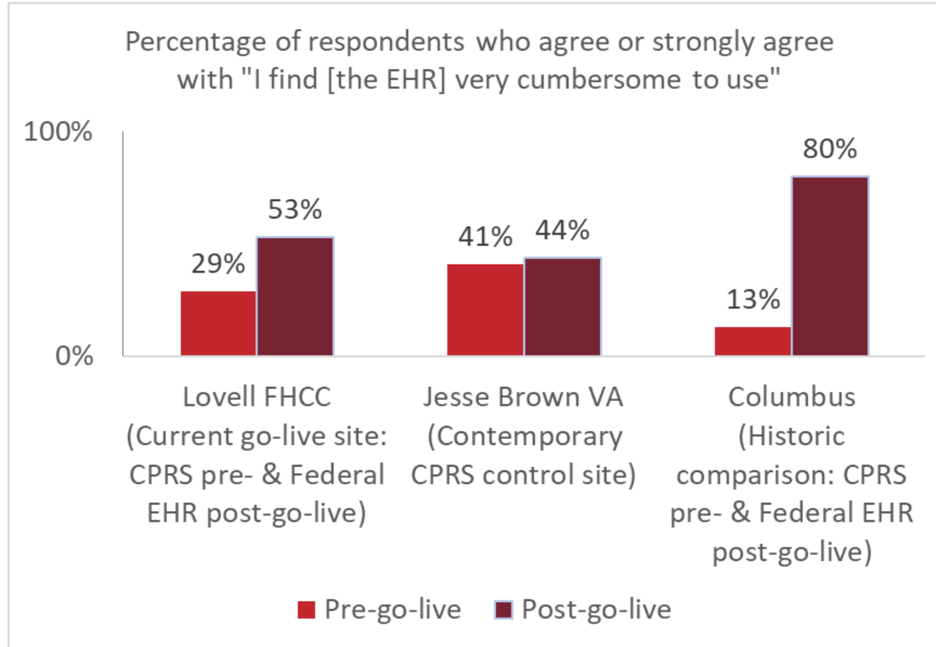
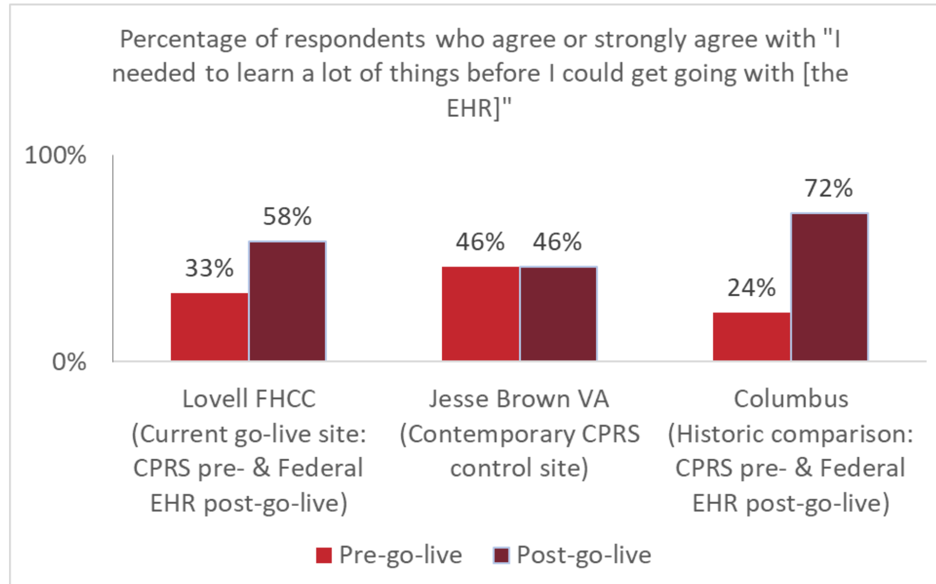



**Figure 20**. Perceptions of need for learning prior to starting EHR use



Two survey items assessed specific attributes of the EHR: Making it easy to communicate with other providers (Figure 21) and having the permissions to access the appropriate views for the respondent's role in the EHR (Figure 22). In both cases, the proportion of respondents agreeing or strongly agreeing decreased at Lovell FHCC following go-live while changing little at Jesse Brown VA over the same period, in contrast to the large decrease that was observed at the Columbus VA following go-live in 2022.

**Figure 21**. EHR ease of communication with other providers

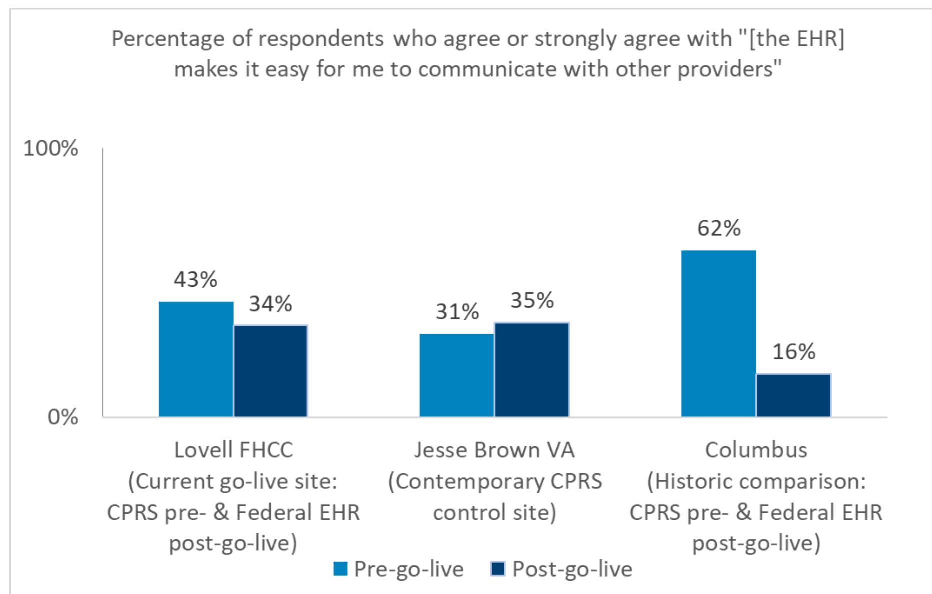
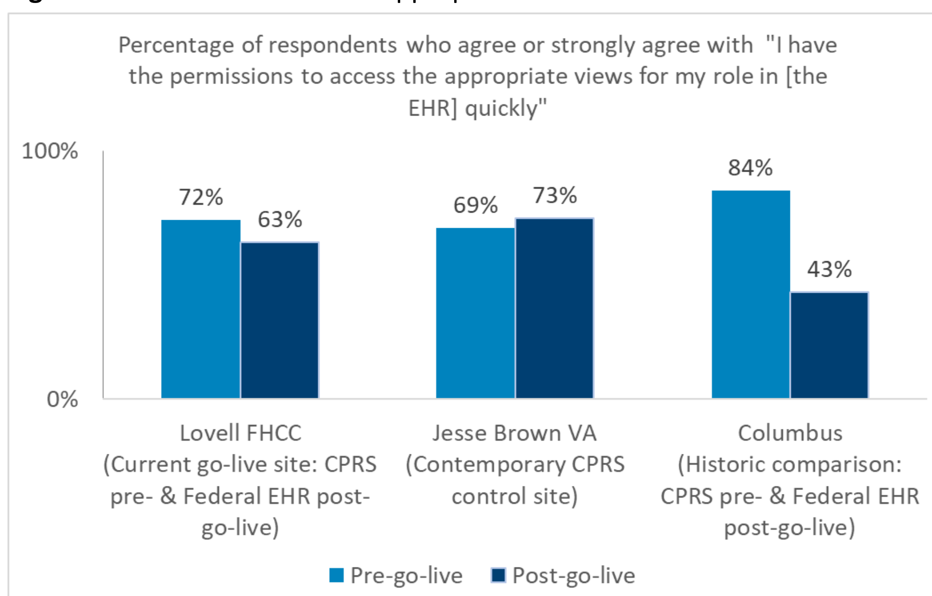



**Figure 22.** Access to EHR views appropriate to role



### *Communication about EHR issues and input on improving the EHR*

Respondents evaluated whether they were made aware of ways to improve the EHR (Figure 23) and whether they were made aware of issues with the EHR that could lead to errors (Figure 24). The proportion of respondents agreeing or strongly agreeing they were asked for input on ways to improve the EHR was low (22%) and unchanged at Lovell FHCC following go-live and only modestly higher (29%) and unchanged at Jesse Brown over the same period, while it had increased moderately at Columbus VA after go-live in 2022. In terms of being made aware of issues with the EHR that could lead to errors, the proportion agreeing or strongly agreeing again decreased at Lovell FHCC while remaining largely

**Figure 23.** Perceptions of being invited to give input on EHR improvement opportunities

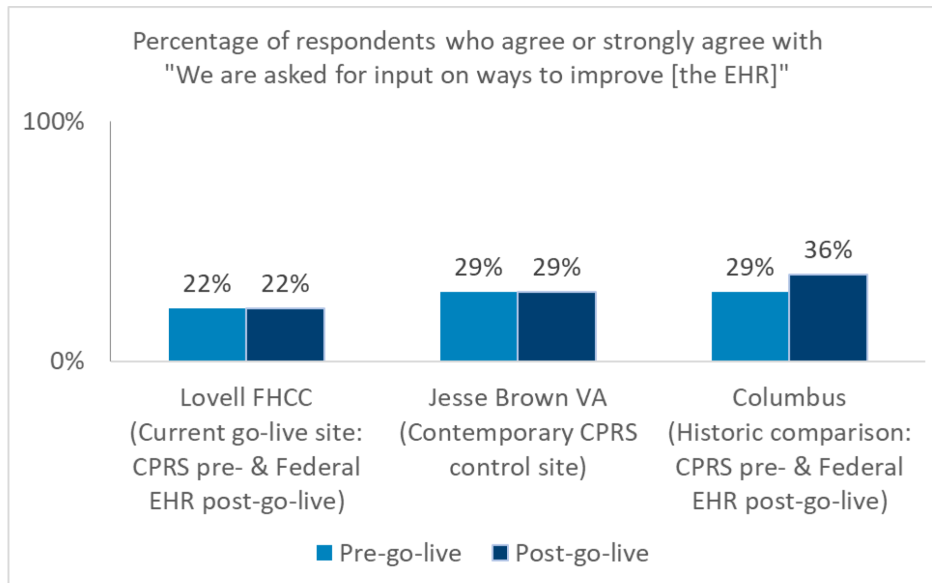
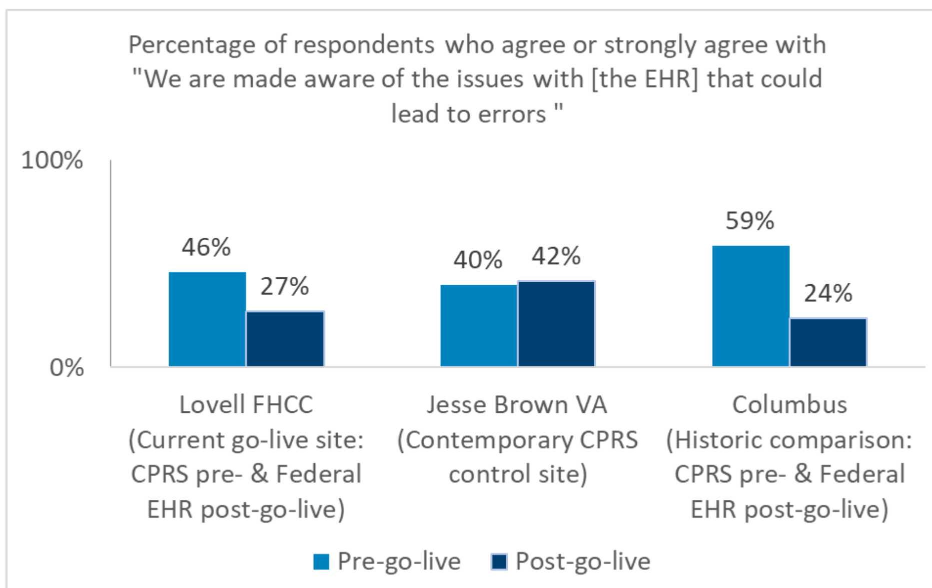



**Figure 24**. Perceptions of being made aware of EHR issues that could lead to errors



unchanged at Jesse Brown VA over the same period, while having decreased dramatically at Columbus VA during the equivalent go-live transition in 2022.

### *Training and EHR support*

With one exception, the same patterns again repeat for items on EHR training and support, where moderate decreases were observed in the proportions of respondents agreeing or strongly agreeing that they are given enough training on how to use the EHR (Figure 25); that training on the EHR is customized to their work area (Figure 26, pg. 26); and that they are adequately trained on what to do when the EHR is down (Figure 27, pg 26). These measures changed little over the same time at Jesse Brown VA, whereas they had decreased sharply at the Columbus VA over the equivalent timeframe after go-live in 2022.

**Figure 25**. Given adequate training on how to use EHR

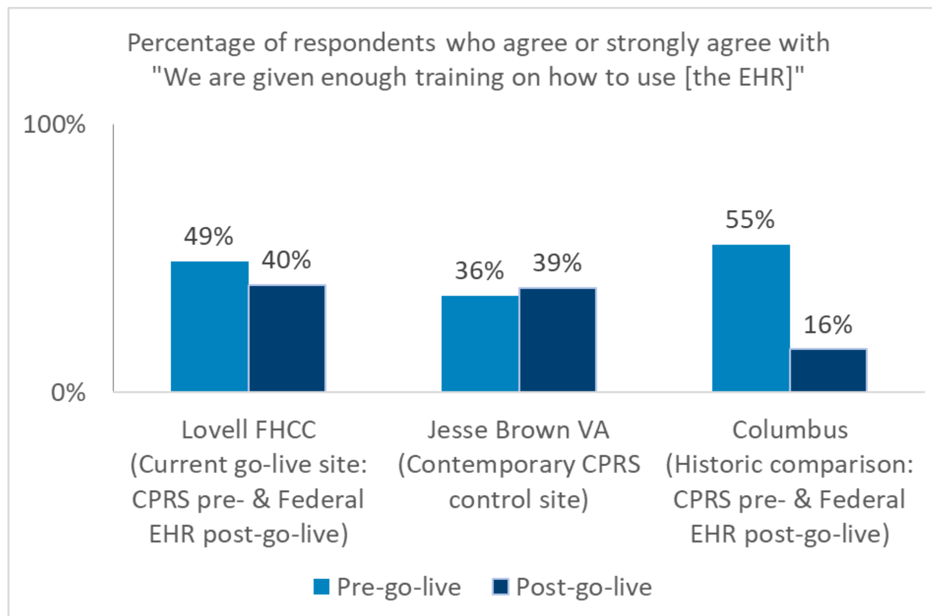


**Figure 26.** EHR Training is customized to work area

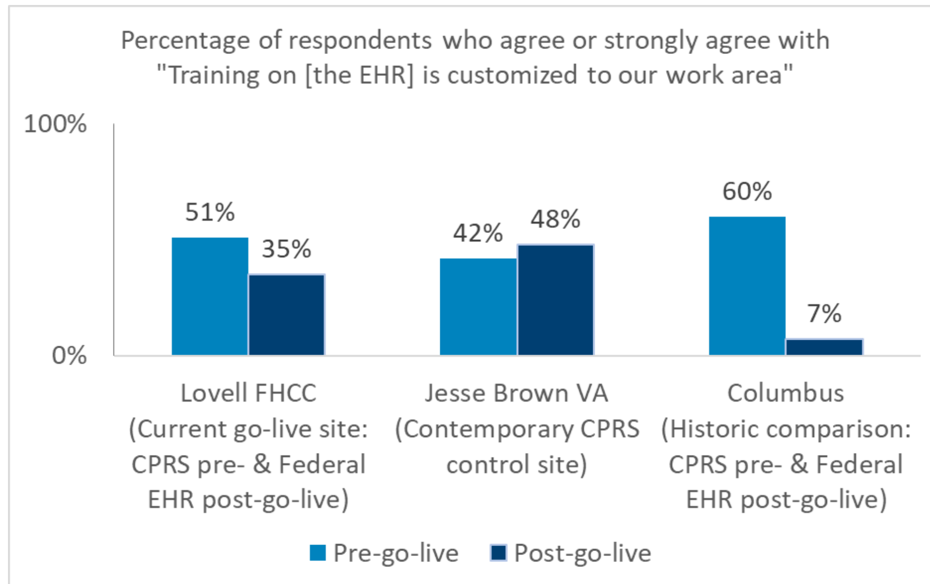
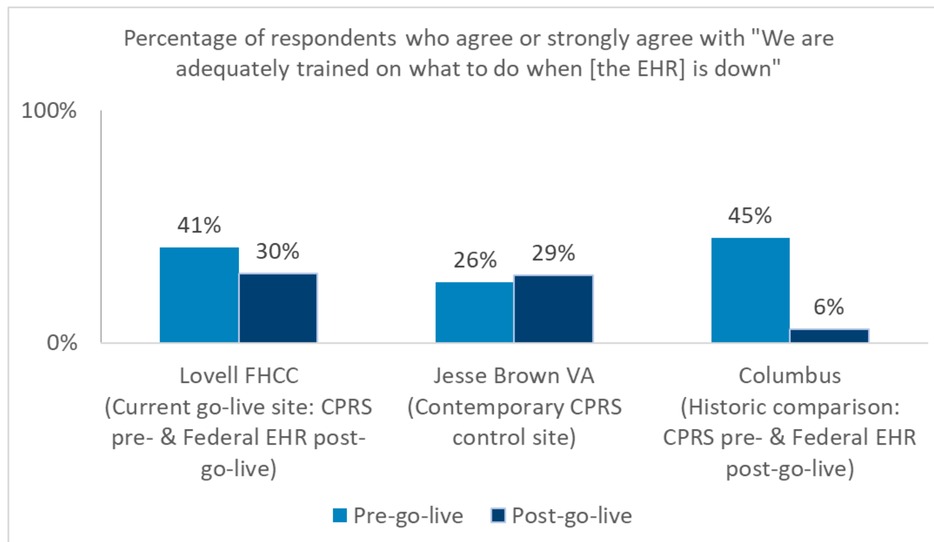
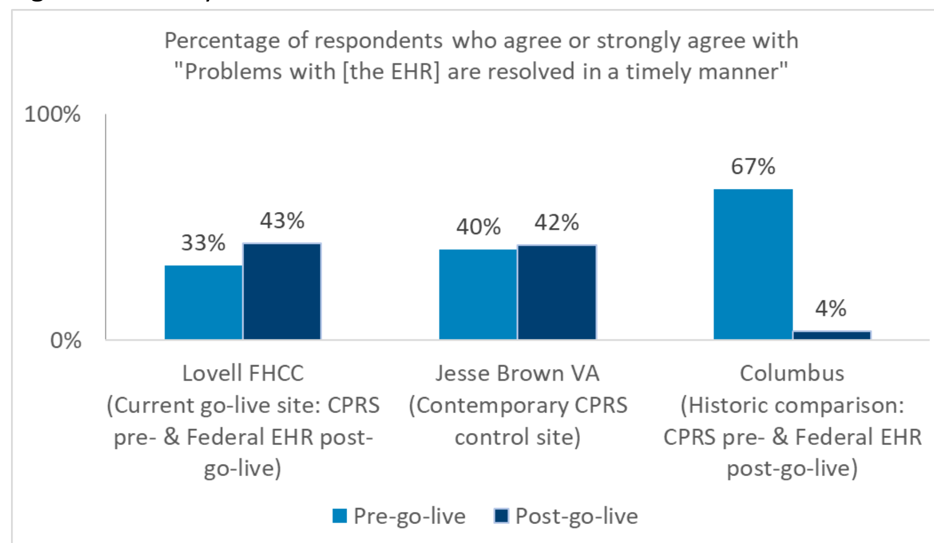



**Figure 27.** Adequacy of training on EHR down time actions



The exception to this pattern was in respondents' rating of problems with the EHR being resolved in a timely manner (Figure 28), where the proportion of respondents agreeing or strongly agreeing increased at Lovell FHCC following go-live while changing little at Jesse Brown VA over the same period, whereas a profound decrease had been observed at the Columbus VA following go-live in 2022.

**Figure 28.** Timely Resolution of EHR Problems



Respondents indicated how many hours of training they received on the EHR in 5 categories from 0 hours to 10 or more hours. There was an increase in hours of training at Lovell FHCC following go-live, with a modal response of 1-3 hours pre-go-live and 10 or more hours at post-go-live (Figure 29a). Training hours on the EHR at Jesse Brown VA was largely unchanged over the same time, and the modal response remained 1-3 hours (Figure 29b).

**Figure 29a and 29b.** Hours of EHR Training – LOVELL (29a) and Jesse Brown (29b)

**Figure 29a.** Lovell

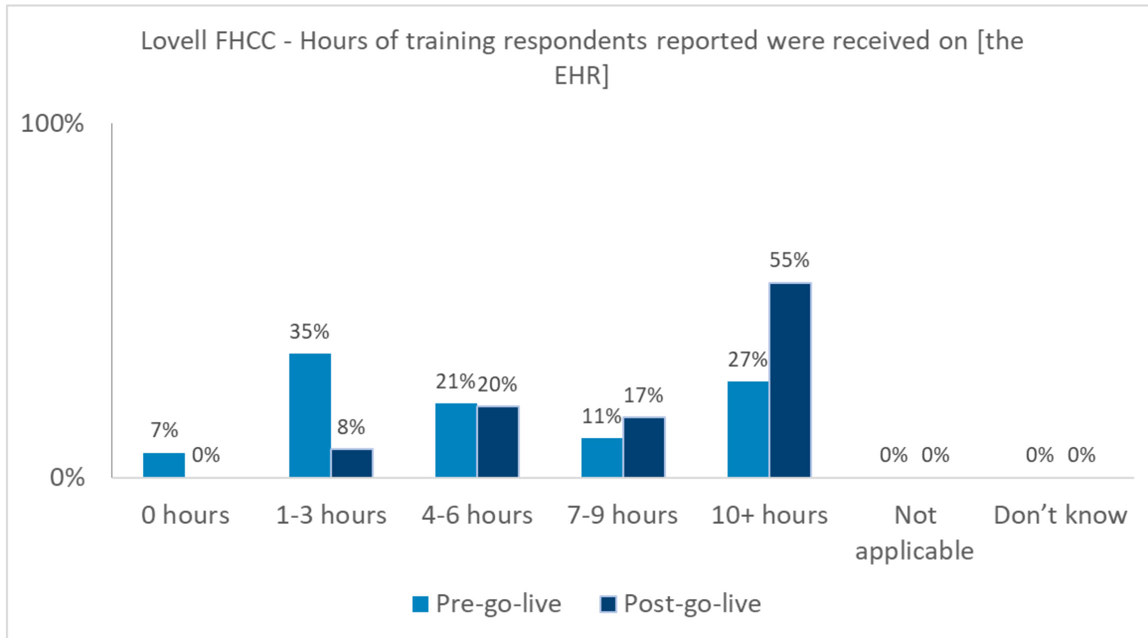
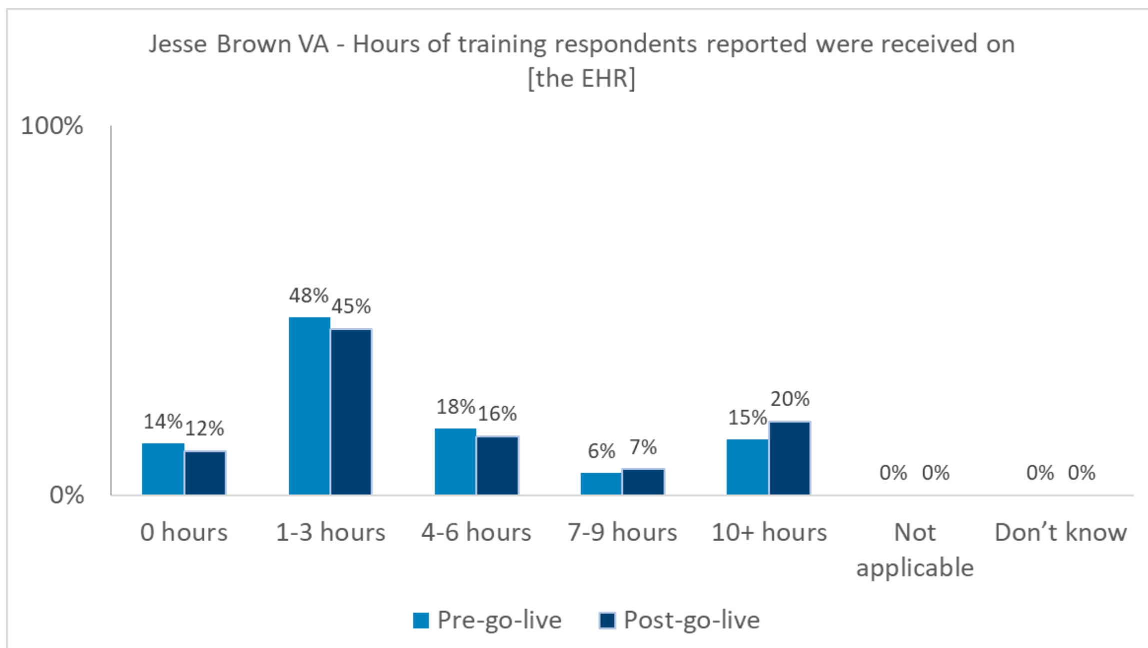



**Figure 29b.** Jesse Brown



### *NESSU*

Respondents at Lovell FHCC were asked if they had received support from the National EHRM Supplemental Staffing Unit (NESSU). Roughly half of respondents indicated they had received NESSU support pre-go-live and this increased modestly at post-go-live (Figure 30). Among those who reported receiving help from NESSU peer support, large majorities found NESSU peer support somewhat or very helpful at both time points (Figure 31).

**Figure 30**. Receipt of Peer Support/Supplemental Training from NESSU

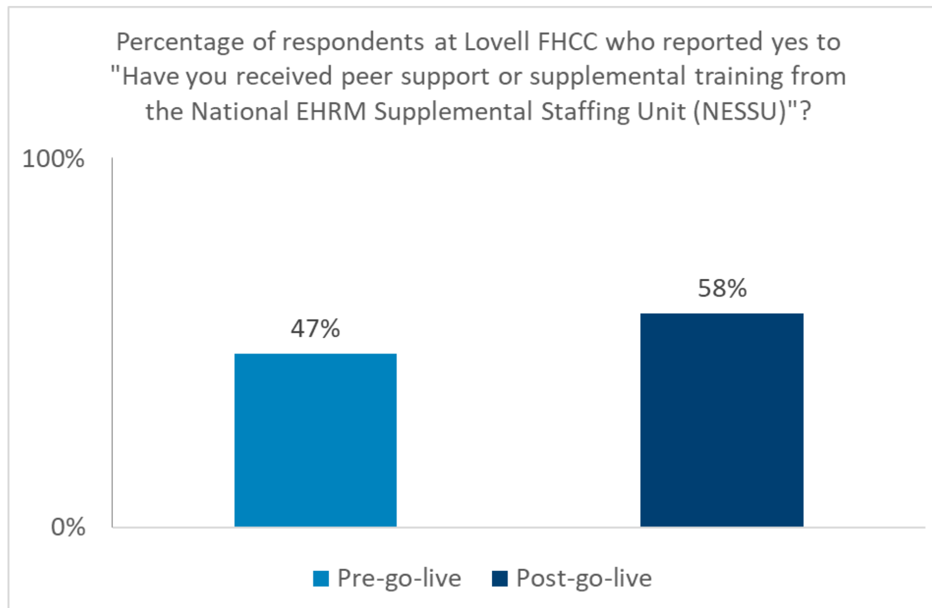
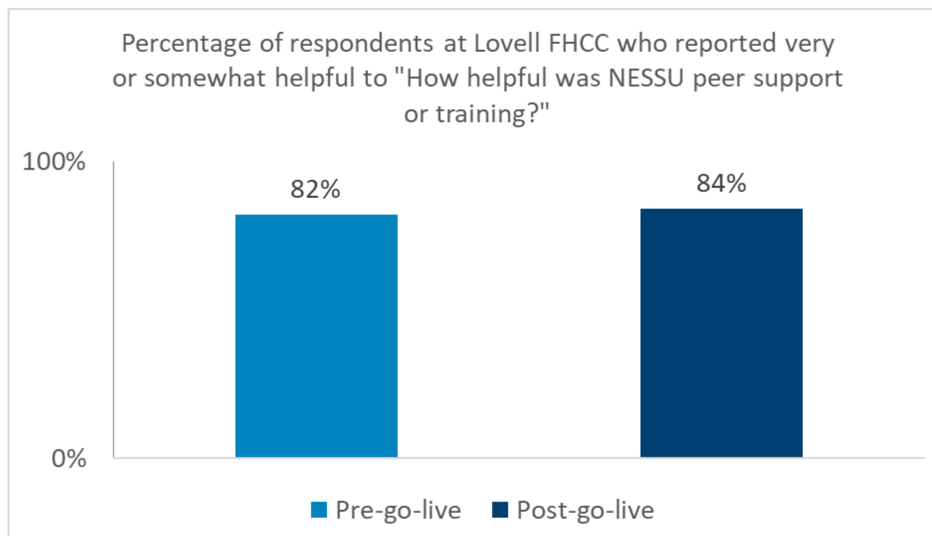


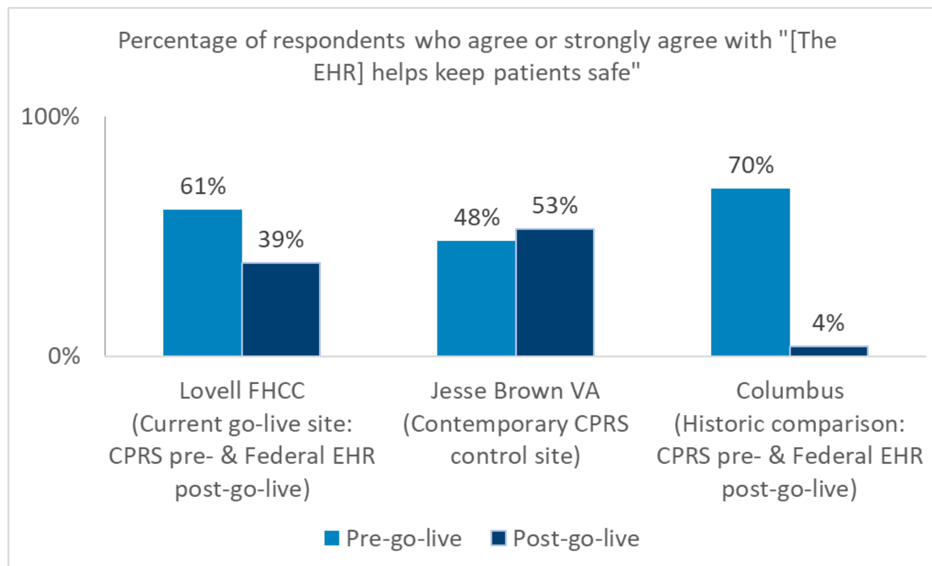

**Figure 31.** Respondents reporting that NESSU was helpful (among those who reported receiving NESSU support)



### *Patient Safety and Efficiency*

Asked about the EHR helping keep patients safe, the proportion of respondents agreeing or strongly agreeing at Lovell FHCC decreased following go-live while increasing slightly at Jesse Brown over the same time, whereas a profound decrease had been observed at the Columbus VA following go-live in 2022 (Figure 32).

**Figure 32.** EHR helps keep patients safe



The survey assessed whether respondents felt they had to enter the same information in too many places (Figure 33); whether they had too many alerts or flags (Figure 34); and how they perceived the amount of time spent on the EHR after hours, a measure of efficiency (Figure 35, pg. 32). The same pattern is observed as for prior negatively-framed items, where the proportion of respondents agreeing or strongly agreeing increased moderately at Lovell FHCC following go-live while changing little at Jesse Brown VA over the same period. The last item (time spent on EHR after hours) was not assessed at Columbus, but as with the prior items, a steep increase had been observed at the Columbus VA following go-live in 2022 in having to enter the same information in too many places; and a moderate increase in having too many alerts or flags.

**Figure 33.** EHR Requires entering same info in too many places

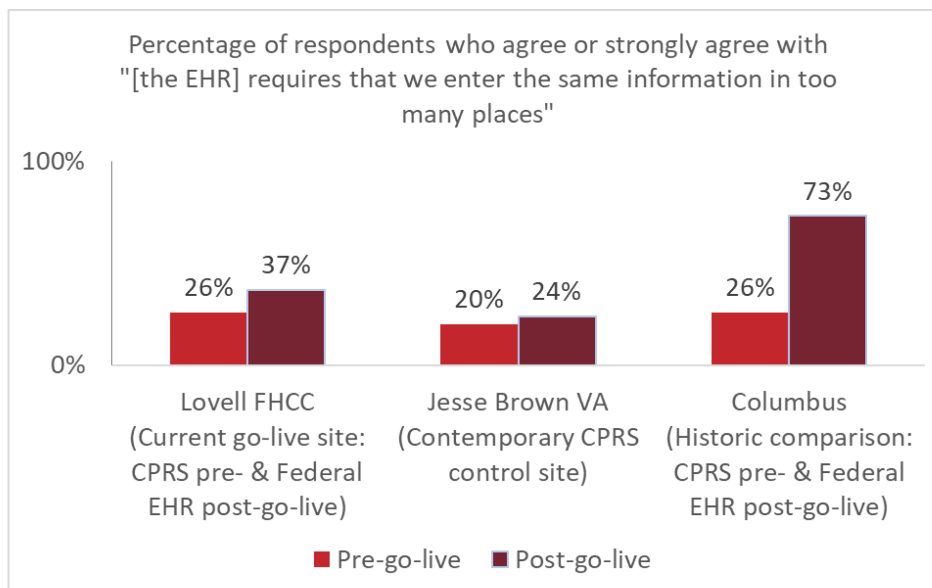



**Figure 34.** Too many Alerts

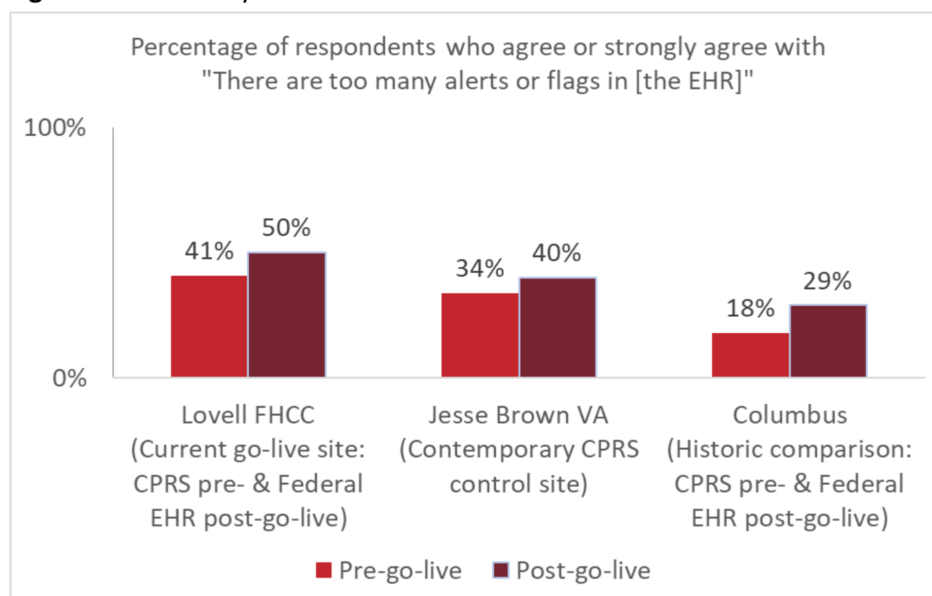
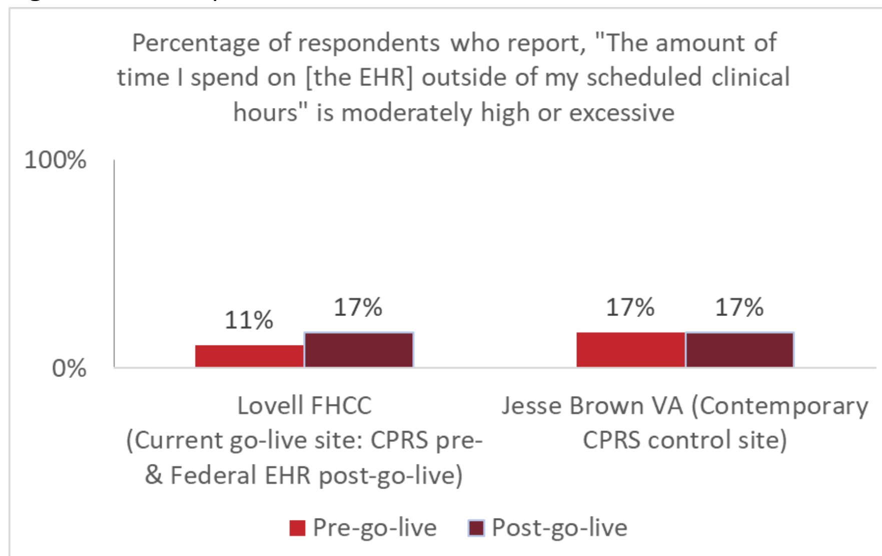


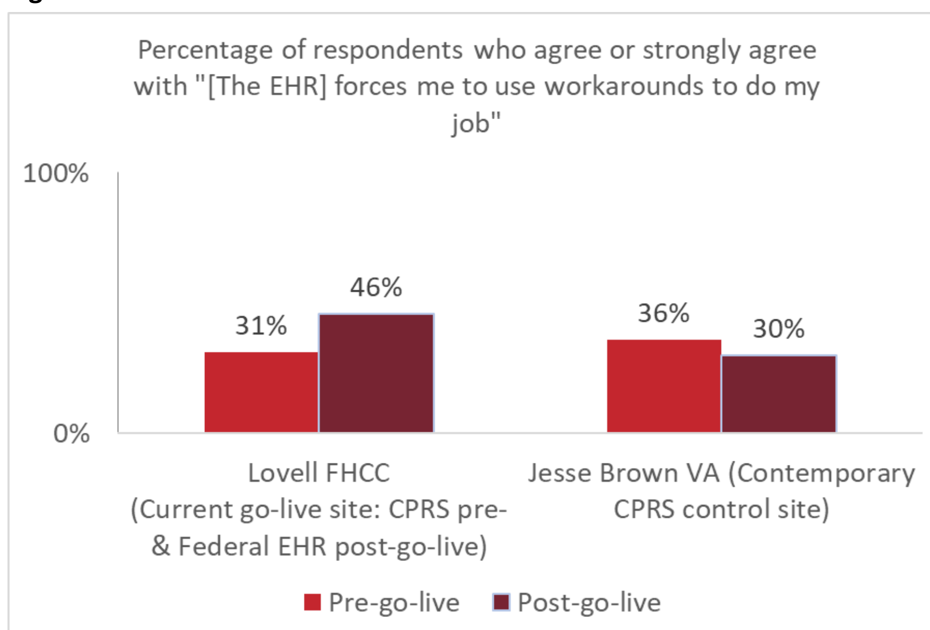
**Figure 35**. Time spent on the EHR outside of scheduled clinic hour




### *Workarounds*

Respondents evaluated whether the EHR forces them to use workarounds to do their job, and the proportion of respondents agreeing or strongly agreeing increased moderately at Lovell FHCC following go-live while decreasing slightly at Jesse Brown VA over the same period (Figure 36). This survey item was developed based on interview findings from the Columbus VA, and after survey data were collected from Columbus during the go-live transition in 2022, therefore equivalent survey findings on workarounds are not available from Columbus.

**Figure 36**. EHR forces use of workarounds



## VI. Qualitative Findings

We have organized our qualitative findings into six categorical areas of interest based on results from our data, as well as areas of importance to our evaluation team and operational partners. These include:

1. Overall experience with the transition
2. EHR usability and functionality
3. Messaging and communication about the EHR transition
4. Training and support
5. Clinic capacity, productivity, and efficiency
6. Impact on Veterans

In many cases, qualitative themes align with those themes identified in the quantitative section, though we allowed for differences in cases where survey questions addressed topics not addressed in detail on interviews, or in cases where interviewees introduced topics not covered in our surveys.

### *Overall experience with the transition*

#### *Participants conveyed a relatively positive overall experience with the EHR transition*

Most participants reported a moderately positive experience with the transition overall, describing it as “not bad,” and “better than expected,” while acknowledging “some growing pains.” Some even described the system as a “pretty good upgrade.” Others indicated that the new system had made work more difficult for certain roles.

> *It's going **way better than we thought**.* E313 post

> *I think on balance, I would say for certain programs, Cerner is better. For a lot of other programs, people still wish they had CPRS. I mean, I think **it's about equal**.* E307 post

> *In general, for the folks who report to me to do their roles**, their jobs are harder right now. They're more complex**. There's a lot -- it takes a lot more brain power as they're having to learn everything. And then there's definitely some areas, like procurement. Another area would be informatics, where there's just more tasks that have to be done. Outpatient pharmacy there's more tasks that have to be done.* E322 post

#### *Relatively few employees noted abnormal stress or anxiety related to the transition*

In contrast to the widespread descriptions of profound employee distress at prior EHRM sites, FHCC Lovell interviewees reported more modest impacts on employee wellbeing. Some noted moderate levels of stress and concern about specific challenges, but stressful or anxiety-provoking issues were much less frequently noted, and overall less severe than at prior sites.

> *In the initial phases [of] navigating and trying to learn the new system … double checking how I'm writing the notes, how it's getting captured, and referrals, where it's going … the process was **a little bit overwhelming** and a little stressful.* E312 post

#### *Lovell benefitted substantially from the experience of prior implementation sites*

Participants described benefitting significantly from the prior VA facilities that had gone live on the EHR. FHCC Lovell leaders and employees learned directly from other facilities, as well as from the national EHRM supplemental staffing unit (NESSU), national program offices, and EHRM councils, all of which had obtained experience at prior facilities. Because of FHCC Lovell's status as a shared VA/DoD facility, insights were also available from DoD sites live on the new federal EHR.

> ***[We] had the benefit of learning from five other sites the problems that they had and what they did to overcome those*** *… [FHCC leadership] went and we visited Columbus. You know, our staff went out and visited Walla Walla. They visited Spokane. So, we had advantages to go out and visit and see how things were going. The other places didn't have that advantage.* ***[Also,] because we're DoD, we could go out and visit DoD sites.*** *We went to visit a few DoD sites … our director went, our pharmacist went, our GPM went, our CHIO went. So, we had people going and visiting. And* ***that was all really helpful because every one of those locations helped us.*** *They educated us. They were friendly. They gave freely of their time.* E302 post

> *That made a positive difference as well: as we would line up, especially on the outpatient side, we had VA staff from* ***live sites like Columbus****, especially, and* ***they would get on a Teams call with our staff and they would teach our staff****.* E322 post

### *EHR usability and functionality*

#### *Some features of the new EHR were viewed as improvements on the prior system*

Despite several challenges with integrating the new EHR into VA workflows, many participants described features of the new EHR that offered improved functionality or efficiency relative to CPRS. Examples included improved access to patient education materials, "autotext" keyboard shortcuts for populating notes, and other functions that automated work that would otherwise have been typed.

> *There's been* ***growing pains for some people … but there's also been some nice things about the new system in comparison****. So, you know, I think everything has its pros and cons, and ultimately,* ***where it stands right now is probably pretty neutral****.* E326 post

> *There is a very* ***good choice of different apps and links that you can go to****, like CDC and databases that are related to the chief problem and the diagnosis for the patient. And you can find all the relevant materials – education – print them out and provide them for the person.* E319 pre

> *One good thing is the dot phrases [autotext keyboard shortcuts] … that's a functionality that will be very* ***helpful for quick charting****.* E318 pre

> *I think there's a lot of* ***documentation that was happening on a local level in CPRS that is not required in Cerner****. So that has changed … If somebody's discharged, there [used to] be a discharge note and a discharge summary … a few different notes that you had to have placed. In Cerner, a lot of that goes away. There's just a discharge summary and the* ***discharge instruction that is generated automatically****.* E304 post

> *On the positive side, [receiving and managing incoming referrals is]* ***less time consuming in this new system than in the previous system****. So I and my staff are liking that … it's easier to run the report to see what referrals are in your queue, where they're at. Have they been started, not started? Have they been accepted, not accepted? Have they been attempted to be scheduled? Are they scheduled? Do they need to be rescheduled because maybe they no-showed or canceled. So all of that kind of shows up in this one queue.* E326

### *Lab order functionality was malfunctioning for several weeks after go-live*

Several participants noted substantial challenges with ordering labs. The most prominent of these challenges was an EHR malfunction that required clinic staff to draw more blood than necessary to complete ordered tests.

> *In CPRS, once the labs were ordered, you could order multiple labs. Like, you could order two labs, then three labs, then another couple of labs. But at the point of collection, all those labs would be combined together, a single label. … **In Cerner, if you put two labs and then one lab and then three labs, they are three different orders. They need three different tubes to be drawn**.* E307 post

> *If a patient has five different lab tests that can run on one tube of blood, we should be able to run it on one tube of blood. **We should not need five tubes of blood**.* E304 post

> *Sometimes we have multiple samples for something that used to be that we could just draw one tube. Now we have to draw three, four, five. And I think that's one of the biggest issues … Originally Oracle's response was like 'it's education,' **[they assumed] the nurses and health technicians are not following the process. Turns out that it's more than just that. We provided education everywhere.** We even had witnesses … we had people from Oracle Cerner come in. We had people from the national informatics team come in. **And it turned out that it's really the system that's not doing what it's supposed to be**, not netting all the orders together. So, you have elderly patients with maybe really frail veins and you have to poke them multiple times because you can't get all the samples you need or **the lab cannot accept them because the [clinic-facing EHR component] is not communicating with the lab system**, which is PathNet. So even if the nurses here scanned everything, it still shows in PathNet like the samples were not scanned. So, I think that's more like **an interface EHR issue**.* E305 post

By the time of our interviews were conducted, the issue had not been decisively resolved, but an organized effort involving local staff, the VA's Office of Nursing Informatics, and Oracle Health representatives appeared to have made progress toward a solution.

> *We had a project here last week when for three days we had people from [the VA Office of Nursing Informatics] and from the facility and from Oracle Health and they worked on the lab ordering specimen issues. And we started to communicate with the nurses the process right now. And basically for labs, they are able to add to the a.m. labs before 3:45 in the morning and then **everything should be netting together, meaning if multiple lab orders can be processed from one sample, you just need one sample … So… we're working on it and hopefully it's going to be fixed soon**.* E305 post

### *Transitions of care were challenging*

Transitions of care within the facility were observed to be prone to challenges related to the way the new federal EHR is structured.

> *In CPRS, patients can go **from inpatient acute medicine, to inpatient psychiatry, to rehab facility, and to our residential programs** seamlessly, meaning CPRS did not make a distinction as to where the patient was. Cerner treats each one of those as a separate encounter. … so **the orders don't transfer over**. Or some of them transfer over, some of them don't transfer over … VHA is … working on a [Standard Operating Procedure] on what happens when patients are moved from [the Community Living Center] to acute medicine, to psychiatry.* E304 Post

*The new Federal EHR was seen as not supporting secure management of controlled substances*

The management of controlled substances was also of concern to several participants. Participants characterized the new federal EHR as overall less robust in the tracking of controlled substance. One explained that the new system did not allow for the independent auditing of controlled substance "balance adjustments" that was required by VA policy.

> ***Controlled substances*** *in the pharmacy world are* ***super important****…the Cerner system is* ***a lot weaker*** *than VistA and then the DoD legacy system…It's not as airtight in terms of* ***manipulation*** *and* ***movement of those perpetual inventories****.* E322 pre

> *We do balance adjustments in our system right now for if a manufacturer bottle either comes with too much or too little tablets … I monthly audit that balance adjustment and make sure that everything makes sense … [Per VA policy,] I'm not allowed to have the key that allows for balance adjustments [because]* ***I shouldn't be auditing*** *myself. [But in Cerner] they can't remove certain elements like that…I will have the ability to do a balance adjustment in Cerner, but I'm still supposed to actually audit it … in policy, that states that you can't do that [yet] I will have that ability to do so.* E111 pre

*Scheduling and check-in procedures were areas of particular difficulty*

Participants reported that scheduling and checking in patients had become significantly more labor-intensive, prone to error, and time-consuming. Some aspects of this increased work were described as potentially temporary (i.e., only necessary for a given Veteran's first encounter at FHCC after the EHR transitions), but other aspects were understood to be permanently slower and more complex.

> ***There's a lot more extra stuff that [MSAs] have to do to complete their job*** *… There's more steps to create an appointment. There's also: it could be easily scheduled incorrectly … The check-in, check-out, everything is just extra tasks, extra clicks.* E325 post

> *In some of these workflows … it's just* ***some of the things are so complicated*** *… To make an appointment for a particular clinic for a patient should be two clicks.* ***In the current [new] system, it does seem to be like rocket science****.* E307 post

In fact, the new check-in process was so much slower that the clinical staff in some clinics were ready to "ramp up" to see more patients after their limited patient schedule during go-live, but could not do so out of concern that their front desk staff would be unable to keep up with a full schedule.

> *It was suggested that the processes will take longer at check in and all that, but I don't think it was clearly explained that it's going to take so much longer that there are going to be significant delays. Currently, our real impediment to further ramping up from the level we are currently is because patient administration or group practice management cannot manage the front desk. So, if the front desk is able to process patients faster, the providers are ready to see more patients, but at this time they're not letting us see more patients because the front desk can't manage, you know, their workflow. I think that's kind of where we are, and I think those could have been better planned and implemented.* E307 post

### *Messaging and communication about the transition*

#### *The volume of communication about the transition was overwhelming*

Participants reported an overwhelming volume of communication related to the transition, sometimes obscuring the most important information. This was true of informational emails as well as meetings, which were often scheduled without sufficient indication of the origin, purpose, or relative priority of a given meeting or informational session.

> *The medical director has weekly or daily announcements that goes out to the entire organization on what to expect for the upcoming week … I think* ***overly communicating is definitely going to be key, but the overcommunication has turned into an overkill*** *… it's just become e-mail burden, because then you find yourself responding … four days later when you used to be able to respond in real time to questions or invitations … The overly communicating perspective has now drowned us in e-mails.* E310 pre

> ***I have so many Teams invitations and meetings scheduled*** *that, like, I've kind of gotten fatigued from all of them. Like, I hardly pay attention to them at all because I have, like, seven of them in a day … Because of my work [with] walk- ins,* ***I don't get to block out time to do those kinds of things. So, most of them, I'm not able to attend anyway. I'm seeing patients.*** E320 pre

#### *Some important changes to workflows and roles were not communicated in advance*

Despite the overwhelming volume of communication about the transition, crucial information about some new policies and workflows was not communicated to managers or end users.

> *I think some of the* ***workflows could have been established and communicated better from the beginning****.* E305 post

For example, a dramatically different process for receiving referrals from other VAs was not adequately communicated to users:

> *Previously, let's say another [VA] facility wanted to refer a Veteran to one of our programs. They would put in an interfacility consult to Lovell, our facility, and it would show up in our consult list and we could directly schedule the patient from there. But* ***now all interfacility consults go to some interfacility consult coordinator*** *and you are at his or her mercy to get that message forwarded to you <…> The way we learned about this whole workflow for interfacility consults was: somebody from another facility … put in a consult and they didn't hear anything about it from us for five days. And they were like, 'hey, people, what are you guys doing?' And then we started digging into it, and then they were like****, 'oh, yeah, it is sitting in the interfacility consult coordinator's inbox.' We're like, what is that?*** *…* ***I did not have any education or anything to tell me that that was going to be the process****.* E307 post

Additional examples included changes in treatment protocols and order sets:

> ***The insulin drip or the heparin drip protocols were kind of not figured out exactly before we went live, which has become a little bit of an issue, and they're different than what we were doing in our previous system.*** *… Even things like our [alcohol withdrawal] order set is different. I like the current one better because it uses more appropriate medications and doses and timings than our old CPRS one. But it is different than what they were used to before.* E314 post

#### *Some communication occurred much later than needed*

Participants described several instances in which they could have participated more fully in training and other team-based preparatory activities if they had received enough advanced notice to block clinic schedules.

> *There's **been a lot of meetings and trainings and things that you're just told when they're going to be, whether they fit into your schedule or not**. And you're supposed to make it happen. And that was even pre-ramp down. So, it's kind of like, "Okay. So, what meeting am I supposed to attend? What training am I supposed to -- and **am I supposed to cancel patients? What do you want me to do here?*** E326 pre

> *We are told about certain things: 'Okay, **you've got training starting in two weeks.' But you need 45 days of notice to cancel your clinic**. So, how does that work? Those kind of things could have been managed better with better communication*. E307 pre

> ***A lot of superusers just couldn't get the required trainings** because of these constraints. So that kind of stuff, I think, was always a problem.* E307 post

Similarly, several participants noted that Veteran-facing communication about the transition occurred too late. While some participants indicated "[Veterans] were thoroughly informed as to what to expect," others felt that the timing of the communication left several Veterans insufficiently prepared for reduced clinic capacity, longer waits in clinic, and the new patient portal.

> *I think the problem was that **a lot of patients did not know about this transition well in advance**…* E306 post

> ***They're not giving communication to the patients until way into January, when we have already started to cut back our schedules**. And the patients don't understand why. And as we're trying to explain it to them in our limited time that we see them, they don't understand fully.* E323 pre

> *I think our biggest problem here in the clinic was the timeline for them notifying the patients… **They waited way too long**. And then the limited communication they did give the patients are not sufficient.* E323 pre

#### *Good responsiveness to feedback*

Though perceived responsiveness to feedback was not universally high, some described specific important instances of adjustments made to the implementation process in response to users' feedback.

> ***Our feedback is taken**. Where we've said, 'you know, the 400-level classes weren't good. We didn't get what we needed from them.' … that was communicated back, and then the response was, 'Let's do more pop-up training. Let's do an individual training with specific disciplines.' And so I think that that's been good. That's been part of the preparation. I think that's been helpful.* E315 pre

In one case, a participant described the EMPIRIC evaluation (the project that developed this report) as a positive signal of the VA's interest in user feedback.

> *It's been really great talking to you ... I mean, you've been a fantastic listener and such a pleasant person to work with, but I'd say the program or **the project that you represent … that's made a positive impact to me**. The fact that, you know, VA has identified, "hey, you know, we need to get -- **there's opportunity for better insight as to what our staff experiences**," and then to have this [evaluation] project underway… just **the fact that VA has identified that and taken a step, I find that very comforting.** And it gives me hope that it'll be another avenue for voices to be heard. And then positive changes to occur.* E322 post

### *Training and EHR Support*

#### *Training and support overall*

End users were presented with different opportunities for training and support. Oracle provided computer-based training, in-person classes, and one-on-one sessions to customize users' individual EHR experience. Other support entities such as NESSU provided different learning opportunities. NESSU support was led by staff with clinical experience within VA and included group workshops and one-on-one support sessions in person and online (via Microsoft Teams chats). Other trainings were self-organized at each facility. Post-Go-Live individualized support options were available from Oracle, NESSU, as well as from peers at other VAs.

During interviews, end-users were asked to describe the EHR transition-related training at their facility. The general nature of the question had the advantage of revealing what end users understood "training" to encompass and brought to our attention any types of training were not already aware of. Responses were overwhelmingly about computer-based training and in-person training form Oracle, along with mentions of supplemental efforts from the facility and NESSU. End-user experience of trainings was mixed.

Main areas identified for improvement included changes to the overall timeline for training, more efficient scheduling, more role-specific training, and the incorporation of more hands-on/simulation aspects into the training. Trainings deemed more beneficial (when compared to early, basic, and computer-based trainings) included those provided closer to Go-Live, more advanced training sessions, in-person trainings, those trainings that involved simulation, one-on-one and peer-to-peer support. The support received outside of scheduled training sessions was viewed positively overall, especially that provided by the National EHRM Supplemental Staffing Unit (NESSU).

> *[The training] prepared us to use the system and maybe this is where you click for this and click for that. But when it came to … clinical function, **nobody really could answer the clinical questions we had about how you're going to apply it to your practice**.* E323 post

> *I would say **Oracle's training approach is inadequate to prepare end users and leadership for utilizing Cerner**. We had gotten that feedback from other sites and so we were able to take proactive steps internally to supplement that training as well as the NESSU program really supplemented training. So globally, we got to a better place in preparation and we had enough training to at least do things successfully. But that is purely because of VA intervention … Cerner was not adequate.* E322 post

#### *Most Oracle-led training did not prepare for specific practices, roles, and workflows*

Many respondents described training from Oracle as too generic and not preparing them for actual practice. While it did help end users acquire an understanding of the basic functionality of the new EHR, it did not provide the skills to use it in their specific role and integrate it into clinical workflows. The quantity of irrelevant or marginally relevant information received contributed to the perception of large portions of the training as a "waste of time." Respondents felt "inundated with a lot of things" that they would not need. The training overall became "overwhelming." Respondents also pointed out that training was not designed with actual clinical workflows in mind and did not address the requirements of specific roles. It was inadequate for teaching how to use the new system in a real-life application.

> *I would say the training was fine if you just only had to do the basics. … We knew how to log on [and] do the basic things. But **in terms of everyday real-life application, I don't think the training gave us what we needed.*** E315 post

While some end-users mentioned the computer-based trainings (developed by Oracle and delivered on VA's TMS platform) as helpful for getting an overview of the functionality of the new EHR, how the chart will look, and how to navigate it, there were far more negative assessments of the computer-based trainings than positive ones. Respondents noted that much of the information was irrelevant to their work and that it was "hard to sift through what is a value and what isn't." Respondents voiced frustration that trainings weren't well structured, did not build on one another, were not clearly labeled, and not in logical, consecutive order. The "proficiency tests" of EHR learning were mentioned frequently as poorly designed.

> *The trainings in TMS … they were just complete garbage. … The proficiency checks … were worse than garbage. … Those are the kind of things that frustrate people. …* ***"Are these people trying to teach me how to use the EHR, or … trying to … trick me into failing … this proficiency [test]?"*** *… I think some of those proficiency tests were just out of the world. … Even the trainers themselves couldn't get it, because it was worded so poorly. … I think those are some of the big, broad, system-wide changes that can be made, I think, which will definitely improve the experience for anybody else going through this*. E307 pre

Compared to computer-based training, the 300 level in-person classes and tutorials and the 400 level one-on-one customization sessions were perceived as more useful than TMS computer-based trainings, with some finding 400 more useful than 300. The 400 level training was self-paced following instructions provided on handouts, which some respondents appreciated while others wished for an additional instructor-led option.

The most consistent critique of instruction-led trainings was the perception of substantial quality differences between individual instructors.

> *I've had* ***some awesome instructors that just were gifted at it****. And they gave a lot of valuable information. Then you have a couple of other instructors who* ***literally just read from the book****.* E317 pre

Participants specifically mentioned the lack of medical background of instructors as a barrier to a successful learning experience. Trainers were frequently unable to answer workflow- and practice-related questions and thus not able to efficiently teach how to use the EHR. End users felt left to their own devices in figuring out how to apply the knowledge acquired from training to their own practice.

Lack of medical background of instructors also meant that they were unable to relay how current practices would change. Some end users reported not being aware of any workflow changes yet discovering some changes after workflow adoption sessions or even only after Go-Live.

> ***They don't tell us about how our clinical practice is going to change****. … They teach us based on their knowledge related to the system. Because they do not work in our hospital, so they can't tell us how our practice and navigation is going to change.* E317 pre

#### *Timing of training and logistics led to inefficiencies and staffing challenges*

Many end users mentioned that the overall timing and coordination of the trainings were not optimal and led to inefficiencies. Many users mentioned that the training, especially the computer-based portions, started too far in advance, and should have been more condensed in the weeks and months before Go-Live. Others mentioned the fact that the specific choice of going live in spring was unfortunate, as it required most of the training to be done during the winter months, with higher incidence of patients requiring care and higher numbers of staff on sick leave.

Frustration was voiced about wasted time and resources due to inaccurate information about the duration of training sessions and long wait times. One online training course took twelve hours to complete but there was no

communication it would take that long; users did not get extra time to do the computer-based training. In other cases, training took much less time than scheduled for.

Especially in inpatient settings, limited availability of classes and off-site training requirements created additional challenges to ensure all staff was able to attend training, while still having enough staff on site to avoid breaks in service.

> *Most of the time [at the training] I was just pretty much waiting. And to me* ***that's a real waste of time****. … Waiting to go to the next step. … There were multiple people in the class and it was all remote and they had to wait for confirmation from everybody that they completed the step. And just the fact that they had a schedule four hours when the class took less than two, it's not ideal*. E305 post

> *[In an inpatient setting:] We had about 20 hours of training that we needed to fit according to whatever classes were available. And that was the really challenging part. … In [an outpatient] clinic you can maybe extend a lunch period and let somebody go to a two-hour class. In an inpatient setting we cannot afford that. We have to pretty much take them off the schedule for the day or* ***schedule them on their day off, which kind of is not necessarily good for their work-life balance****.* E305 pre

Respondents mentioned a number of issues with the scheduling of training sessions and some expressed the need for a more streamlined schedule. VA supervisors reported having been tasked with mediating between their staff and Cerner, adding an additional burden and leading to inefficiencies. Some participants mentioned that having a dedicated scheduling team to coordinate training appointments directly with staff to be trained would have been helpful.

#### *Hands-on practice had a positive impact on learning experience*

An overwhelmingly positive experience was reported by many respondents for any training that involved hands-on practice, including shoulder-to-shoulder demos and one-on-one Microsoft Teams sessions with screen-sharing, and especially for clinical simulations, using test patients in the sandbox, training with mannequins in simulation labs, and visits to other sites, whether these options were provided by VA national offices (e.g., NESSU, SimLEARN) or self-organized at the facility.

> *The fact is* ***you have to use the system to learn it****. … And if you're not using it, and you're not under pressure, you're not going to learn it. … Failing, as long as it doesn't cause patient harm, is okay. You know, me putting in a wrong order, and the nurse telling me that, is okay so that I learned how to correct it.* E309 pre

However, participants reported that there were insufficient simulation opportunities, and that the most widely available tool for hands-on learning, the EHR "Sandbox," test environment, was not available early enough.

Once available, users reported that access to the Sandbox was very cumbersome to log on to. A frequently voiced frustration was that the Sandbox was severely limited in functionality. This even had an impact on instructor-led classes, as trainees could not complete certain tasks because the sandbox did not allow them to. This problem was especially salient in the lab context: for instance, labels were not printing and thus there is no way of practicing beforehand and identifying potential issues.

Many respondents favorably mentioned learning from other sites that already have been working with the new EHR, including virtual support provided by support staff from other sites that had already transitioned to the new EHR, staff from one of those sites visiting Lovell, as well as visits to one of the sites to be able to witness the new EHR in action and participate in daily practice alongside experienced staff.

Immediately before and after go-live, some facilities offered several workflow adoption sessions, running a simulation for the primary care team, including one representative from each role, of how to process a patient from start to finish.

The computer display was mirrored onto a large display for the full team to observe. These sessions were mentioned as very beneficial and helped end users identify "loopholes, barriers, and missing pieces" to be aware of.

> *I thought those were very effective, and those were great practices to have adopted prior to going live.* ***People felt so much more comfortable with going live*** *because of the fact that they had that simulation.* E310 post

*Requesting EHR fixes and changes remained challenging*

Many participants reported that making requested changes to the EHR to fix problems with its functionality could be extremely onerous and slow. Several explained that complex and ambiguous governance of the EHR was a barrier to making timely changes, as well as a barrier to obtaining authoritative guidance.

> *Requesting changes, that's a whole rigmarole. It's really impossible to get anything changed because apparently it has to go through a lot of committees. There's a local committee, ISC, they have to approve it and then it goes to … a VA council and then it gets escalated to a national combined DoD VA council. [...] Nothing has changed as far as I know. E304 post*

*Support was generally abundant but insufficiently coordinated*

Participants described an abundance of staff from several different parts of the VA on site to assist and troubleshoot issues during and after go-live. This involved substantial involvement from VA national offices, EHRM councils, and other high-level VA leaders who traveled to FHCC Lovell, who were frequently relied upon to provide the answers that Oracle employees could not. This led several participants to suggest that the amount of support was generally sufficient, but the coordination of that support was lacking.

> *We have NESSU that's helping us remotely, which is great. But we also have* ***point of contacts with subject-matter experts from ONS*** *[the VA office of nursing services], who we just have stayed in communication with, who are* ***showing us things that … we never got from Cerner*** *... And these are* ***key things for our operation within primary care*** *that, you know, we're getting from someone from ONS, who has been obviously working with [prior] sites.* E318 pre

> ***When it came to support … it was not very coordinated****. So, we get random calls from all these different agencies and groups saying, 'hey, we heard you guys need support, and we are here to support. What do you need? What do you need?' And at one point,* ***it got overwhelming, like, 'who are you people?*** *I mean, I don't even know who you are.' And we've been contacted by like 15 different people. And… I don't know where I'm gonna put all these people. How are we gonna coordinate with all you guys, you know? … The thing that really worked was the whole NESSU process. Their team was phenomenal. They reached out to us, clearly explained the process, they set up all these support lines ...* ***NESSU was good, but all the other additional supports were a little hodgepodge, not very coordinated.*** E307 post

*Support from NESSU was especially highly valued*

NESSU, the national EHRM supplemental staffing unit, is a group of VA clinicians who support facilities going live on the new EHR by providing: 1) peer support to help facility employees understand and use the new EHR, 2) direct patient care to offload facility employee work while they adjust to the new EHR, and 3) assistance with manual data migration - again, to ease the burden on facility employees. Most NESSU services are provided remotely, from clinicians located across the country, but some NESSU clinicians arrive to provide assistance in person.

Support provided by NESSU stood out in terms of the quantity of mentions among interview participants, as well as its reported quality. Participants explained that NESSU staff were not only knowledgeable about the new federal EHR, but

were able to explain its features in contrast to CPRS, and in doing so, filled an important gap in the training and technical support offered by Oracle.

> *When staff are going to Cerner, it's like completely new. And then **we're asking questions based on what we've seen in CPRS**... Oracle don't understand, unless they've worked in the VA or heard it from other sites.* E318 pre

One feature of NESSU's support that was particularly appreciated was its speed and accessibility.

> *Typically, **the fastest response** [to questions about the EHR] will be received via the Microsoft Teams chat that NESSU is currently guiding"* E306 post

> *We have **NESSU nurses available to us throughout the day in order to ask questions** and provide training if we need it … They're online. So, they have access to our [Microsoft Teams chat messaging platform] and **we can message them whenever we need them** … I keep my eyes on it because there are other people that use it daily.* E317 post

Participants also explained that it often took active engagement on the part of the facility and its leaders to get the most out of NESSU's services.

> *[NESSU is] a phenomenal resource and without them, you couldn't ramp down enough and still have your patients all seen, without shipping everybody to the community, which would ultimately then shut down the VA system. So I think it's money well spent to have potentially even a larger NESSU staff when they go in somewhere … One of the things we heard from NESSU was, 'hey, at other sites, they didn't really use us enough,' … And so we tried to have a weekly meeting. 'Are you getting enough referrals your way? Do you need more? You know, how can we make sure that you're being utilized effectively?' And so our leadership, along with NESSU … really worked at that and it's going very well.* E326 post

> ***Having consistent meetings with NESSU has been very effective to find out what the staff needs**, what the department needs.* E310 pre

Finally, participants suggested that beyond the knowledge base and specific services provided by NESSU, the attitude with which they approached interactions with end users was an important feature of their success.

> *"For those couple of months that they've been here … even though some of them I communicate with [them] … only virtually, **I can feel the bonds they're building**… It's not like "they're the experts and we're the losers that don't know anything." The whole atmosphere is of supporting and consideration … **they bring the human factor that is so deficient these days** … You know how when you start getting stressed out and you blank out, you don't think clearly? … "Oh my god, what should I do?" **They kind of manage this human interaction in a very positive way**."* E319 pre

### *Clinic Capacity, Access, and Staffing*

#### *Where feasible, ramp-down of clinical care was viewed as critical*

In anticipation of transitioning (and learning Cerner in real time), where feasible, clinics scaled back on the number of scheduled daily patient visits.

Outpatient and specialty clinic staff described how they ramped down in the weeks prior to go-live in order to allow time for staff to learn the new system. In some settings, scaling back involved seeing 50% of patients compared to "normal" times, followed by gradual, stepped increases over time.

> *Having our providers and the nursing staff scrub their lists to prepare for a ramp-down so that they're not bombarded when we actually go live and it gives them time to practice and learn the system, I think that was critical for us. Some providers took it a little more serious than others. But I do think that was very beneficial for us and the patients because the last thing you want is a line of patients standing, and you're trying to figure out the system still. So, it just kind of keeps the confusion and the frustration levels down.* E313 pre

Inpatient units, including the ED and ICU, could not ramp down due to the nature of their work, and instead prepared for go-live by supplementing with additional staff. However, participants noted that supplemental staff were not always an appropriate substitute (e.g., for psychiatrists who had developed trusting relationships with patients), and, when appropriate, were often difficult to recruit.

> *Unfortunately, due to the way acute care works, there's not any opportunity to do ramp down … So, we're just going to end up going live with our full patient load on all the units.* E314 pre

#### *Ramp-down was insufficiently planned for and coordinated*

Participants suggested that the facility would have benefitted from a higher degree of coordination and guidance on which settings would need what amount of ramp-down at each point in the transition. While some received guidance from prior go-live sites:

> *…one of the first things that we did is kind of talk to sites that have already gone live to see what, you know, what are – like, what kind of patient flow and capacity they have been able to manage and what was – like, from baseline, how much did they go down, you know, at the time of go-live or what they could manage at go-live. E307 pre*

Others reported insufficient available information to inform the timing and magnitude of ramp-down in each clinic, and in some cases, too little advanced notice of ramp-down plans, resulting in the need to cancel erroneously scheduled appointments.

> *I think had the scheduling issues … been better thought out and implemented earlier, then we could have at least closed the schedules and then opened them up as needed, versus completely open up everything and then have to go back and cancel patients, because that's still, to this moment, an ongoing problem.* E306 post

> *It wasn't very systematic and it caused a lot of issues, and so it caused us to have to do a lot of rework of scrubbing schedules.* E323 post

Some underscored the importance of communicating ramp-down plans to all of the separate organizational entities involved in scheduling, including local MSAs, the facility clinical contact center (CCC), and national supplemental staffing for scheduling (via NESSU).

> *So, because we have CCC [a call center] that schedules the patients, you lose control of the [scheduling] grids. And so, when you're trying to ramp down, you have to be in communication with CCC to ensure … they are in conjunction with whatever changes you're making. Because every time you try to, let's just say, reduce the clinic by five patients or the census by five patients, they will go back behind you and admit five patients or schedule five patients because it'll look like room of opportunity for them, but it becomes a nuisance for you because it's like every time you empty the bowl, water is just being poured into it.* E310 post

#### *The new EHR relies more heavily on MSAs for essential tasks that affect access*

MSAs (medical support assistants) provide many essential functions, such as checking in patients, making appointments, rescheduling appointments, etc. Participants described that due to role restrictions in the new Federal EHR, there are a greater number of functions that only MSAs can perform, and this was perceived to affect clinic capacity and patient access.

> *They also restrict appointment making to only MSAs. And they've restricted those functions from providers. In fact, back in CPRS, we all had keys to make appointments. Like, for example, I sit in a different building. There is no point having one MSA for me just because I'm the only provider in this building, right? And my patients see me in my office. So, I should be able to schedule appointments, check them in, check them out, print their after-visit summary, give it to them. But that functionality is not there … So, the efficiencies are lost when you restrict access to certain functionalities.* E307 post

Some also noted that the new messaging platform (message center) had resulted in an overwhelming amount of extra work for MSAs, potentially resulting in a need to hire additional staff.

> *It's been extremely chaotic recently. We've kind of learned a lot as we have already went live. It takes a lot more staff to be able to look at all of the queues, which is the appointment requests to deal with the message center, which is the pools with all the messages coming back from providers and clinical staff. It takes a lot more staff than we – than we were ready for. Let's see what else? There's – so the pools, the messages through the message center. Referral management, if your clinic uses referrals, we deal with a lot of the mental health referrals. It's just a lot to manage for admin staff that we have. I don't think I initially thought it was this much behind it. And I know our management has advised that we need more admin staff to function, but hopefully, that will eventually happen and we get more staff to help deal with the mass amount of notifications.* E325 post

#### *Short- and long-term supplemental staffing was seen as essential to maintaining access during the transition*

Ramping down gives staff extra time to learn the system yet meant less access for patients. Some patients could be seen virtually by NESSU or Clinical Resource Hub staff, but others preferred to be seen in person by a familiar provider, and their appointments had to be postponed, sometimes for many months.

Another strategy used by clinics that could not ramp down was hiring not-to-exceed (NTE) staff; that is, staff whose tenure would not exceed one year.

> *I think that's one of the first things we did to make sure that we have adequate staff. And then we got some supplemental EHRM-related, like, 'not to exceed' positions … we mostly got it in [inpatient] nursing. E307 pre*

NESSU and CRH staff were essential to providing support during the transition to improve access for Veterans. Most of the support provided was virtual, although some staff did work onsite.

> *We have several NESSU nurses and providers come on staff, whether it's remotely assigned or here in person. So, we have a lot of support staff that are familiar with the programs that are available to us as resources.* E317 pre

### *Perceived EHRM impact on Veterans*

#### *Ramp-down caused long wait times for Veterans*

Many employees relayed that Veterans were frustrated with long wait times for medical appointments with their regular provider, due to a reduction in available slots for visits caused by the "ramp-down" in preparation for the go-live.

> *…there's some frustration with not being able to be seen for months… I mean, that's the main issue…* E324 post

*So we're pushing… our patients out. July, August, September. We're having difficulty getting some of the pre-ops in. We're working it out. It's just causing increased work of having to scrub the schedules almost on a daily basis to see where we can fit people in and hoping that they're available…* E323 post

*I've had some, you know, because of the ramp down and the clinic closures, I've had some Veterans definitely not be happy about the fact that they've not been able to get in to see their VA physicians and they've had to be referred out to community care.* E304 post

#### *Challenges with lab orders resulted in unnecessary sample collection*

As described in the section above on EHR usability and functionality, the new federal EHR initially required different procedures for lab tests than CPRS. For example, a series of tests that was formerly performed with one tube of blood now required multiple separate tubes.

*…we had instances when the nurses or the health technicians had to draw 10, 11 tubes from a patient. And if you do that multiple days in a row, that's unpleasant for everybody.* E305 post

In addition, some described a lack of clarity about labeling samples resulting in unnecessary repeated testing.

*The way we see test orders, and the way the lab sees them are not the same. And it has caused samples to be thrown out or discarded because the lab views them as being, like, improperly ordered or improperly labeled. And that has caused some problems for us. Like, we had one patient who had a vaginal swab done, which is obviously a sensitive and invasive exam, and then the way it was ordered was not the way the lab was expecting to see it. They threw the sample out. So, we had to recollect another vaginal swab, and that sample was also thrown out. And that this patient has four vaginal exams before, like, we were able to actually order it the way that it was supposed to be ordered per lab.* E324 post

#### *Many experienced challenges with an unfamiliar patient portal*

The new patient portal (My VA Health) was widely described as more difficult to use than the more familiar legacy portal (MyHealtheVet) and lacking some of the functions that Veterans were accustomed to in the prior portal.

*The only thing I've heard about the patient portal is from... a couple staff who are patients. And so the patient portal, it's kind of confusing. There wasn't enough information provided to the patients about the patient portal.* E323 post

*Patients have also voiced that they can't receive their medicines there or like renew their meds like they could for MyHealtheVet. So definitely some more education on that aspect.* E318 post

*They said it's just not an easy system to navigate now, and you feel bad for them because we've had our old system for so long that they just -- they're conditioned to use it. They know what to do.* E313 post

#### *Other EHR workflow and functionality differences impacted patient experience*

Participants offered a variety of examples of new workflows or different EHR functionality that detracted from patient experience and convenience. One described a potentially temporary gap in the ability to print and send appointment confirmation letters:

*We're getting a lot of questions from our patients regarding the letters because we don't have a letter system as of yet. With the legacy system, we used to always print out confirmation letters, but we don't have that anymore moving forward. They will have their itinerary, but that's kind of different from what they're accustomed to. So, one of our barriers is just the patients – they like that piece of hard paper.* E313 pre

Another described how EHR workflow changes resulted in potentially redundant data collection:

> *…the check-in, check-out, everything is just extra tasks, extra clicks, your double, you're verifying everything at every check-in, home address, phone number, insurance, all of that, every single appointment. So a Veteran, if they have five appointments, they're going to be asked the same question five times. And, you know, some people don't like that.* E325 post

Additionally, participants noted the limitations of the community-based care that substituted for VA care during times of diminished clinic capacity:

> *I am concerned about the patients that are going out to the community…. especially for mental health ... I don't think they provide the same level of care that we do. You know, if someone no-shows to an appointment [in the community,] they don't have to call them three times and send a letter and try to engage them back. So, I think that part is concerning to me.* E315 post

# CONCLUSION

Overall, EHR users at Lovell FHCC reported many of the same difficulties that users have reported at previous VA sites, but difficulties at Lovell were much less pronounced, and experiences were much less negative. Similar to EHR users at prior EHRM sites, users at Lovell reported issues with most aspects of the transition, including related to EHR usability, training and support, communication, and patient safety impacts. However, while EHR users at prior VA sites experienced profound problems and stress, EHR users at Lovell described a far-less distressing transition.

In terms of positive developments, EHR users at Lovell said they were able to learn from prior VA sites, and those lessons helped them navigate the transition. Peer support and training remained a strength; the National EHRM Supplemental Staffing Unit (NESSU) was particularly valued and both helped maintain capacity and served as peer-trainers to fill gaps in vendor-based training. Perceptions about timely resolution of EHR problems improved following go-live, whereas it worsened substantially at prior EHRM sites.

At the same time, substantial problems with the EHR and the EHR transition remain. EHR users continued to encounter difficulties with a range of specific functions, including lab ordering, patient check-in and scheduling, and transitions of care. They reported that local leaders and end-users received inconsistent communication about workflow changes and needed better service-specific guidance for managing reduced clinic capacity during the transition. While training was improved relative to prior sites, training experiences continued to be negative; the vendor-led training was poorly coordinated and did not meet users' needs. Relative to pre-go-live, fewer survey respondents at post-go-live reported receiving adequate EHR training and fewer reported access to training customized to their work area. While patient safety concerns were not as pronounced as at prior sites, fewer Lovell users expressed confidence in the EHR to help keep patients safe following the transition to the new Federal EHR.

Below, we provide recommendations based on these results, and prior evaluation findings. Our recommendations for improving the VA's EHRM were developed through a comprehensive analysis of survey and qualitative findings, coupled with insights from prior evaluations and relevant literature. By integrating these diverse sources of data, we strove to present recommendations that are both evidence-based and aligned with current best practices for EHR transitions.

**RECOMMENDATIONS**

*Leadership & communication*

- Connect future EHRM site leadership with engaged leaders at Lovell and other EHRM sites to **provide mentorship** on strategies and **access to playbooks** guiding successful implementation of the new EHR.
- Develop **additional planning resources** for site leaders, including communications plans for the EHR transition and guidance for planning appropriate ramp-down in each service.
- Consider cumulative burden on staff and use communication strategies that **help staff prioritize those meetings or messages that are most relevant to their roles.**
- Consider **exempting EHR transition sites from competing priorities** beyond direct patient care and normal site operations for a period of time before and after go-live. Sites may need this exemption for an extended duration as they adapt to the new system.
- Provide clear **guidance to sites about governance** of the new federal EHR and of the transition process to reduce conflicting messages and avoid ambiguity about who is responsible for which decisions.
- Provide clear **guidance about clinical policies and workflows changing** at the time of EHR transition, and recommended dissemination plans / implementation resources for these changes.

- Anticipate the impact of reduced schedules on Veterans, and **communicate with potentially affected Veterans early**, so that they understand the reasons for lower-than-typical appointment availability and other changes to Veteran experience related to the transition to the Federal EHR.

*Training*

- Bring more EHR training in-house and **clarify or amend contractual language that might constrain VA ownership of training.**
- **Ensure that training orients users to potential failure points**: i.e., steps in an EHR workflow which, if not A
- Provide more opportunities for **simulation-based learning**.
- Prioritize **improvements in the coordination and scheduling of training**, being mindful of users' clinical obligations.

*Support*

- **Reinforce peer support networks** that engage experienced users to disseminate lessons learned.
- **Destigmatize support-seeking** and promote effective adult learning by reinforcing **a culture of psychological safety.**
- Expand National EHRM Supplemental Staffing Unit **(NESSU) staffing and encourage end user participation in group and 1:1 sessions**.

*Continuous improvement*

- Conduct **systematic studies of "steady state" workflows to identify areas of reduced efficiency.** Insist upon EHR functionality that at least maintains prior efficiency levels, except where explicitly justified by measurable gains in other important outcomes (e.g., patient safety).
- Continue to **evaluate the user experience at future go-live sites** and consider the benefits of providing users with opportunities to share their perspectives and make their voices heard.

# APPENDICES

## I. Funding and Acknowledgements

This quality improvement project was funded by a QUERI partnered evaluation initiative entitled, "EHRM Partnership Integrating Rapid Cycle Evaluation to Improve Cerner Implementation" (QUERI PEC 20-168). EMPIRIC projects have also been funded by the Office of Clinical Informatics (OCI); the National EHRM Supplemental Staffing Unit (NESSU); and the Simulation Learning, Evaluation, Assessment, and Research Network (SimLEARN).

**MPIs:** Seppo Rinne, MD, PhD, Sarah Cutrona, MD, MPH

**Survey lead:** Christian Helfrich, PhD

**Qualitative lead:** Julian Brunner, PhD

**Project Director/ Point of contact:** Suzanne Morrissey, PhD
suzanne.morrissey@va.gov
781-879-3758

We would like to acknowledge the EMPIRIC Evaluation Team Members for their contributions to this project:

- Seppo Rinne, MD, PhD
- Sarah Cutrona, MD, MPH
- Sherry Ball, PhD
- Julian Brunner, PhD
- Adena Cohen-Bearak, MPH, MEd
- Ekaterina Cole, MS
- Krista Dashtestani, BA
- Gemmae Fix, PhD
- Kimberly Harvey, MPH
- Jan Hauck, PhD
- Christian Helfrich, PhD
- Alexander Kloehn, MPH
- Brianne Molloy-Paolillo, PhD
- Suzanne Morrissey, PhD
- Jay Orlander, MD
- Sarah Pitts, MA, MT-BC, LPMT, CPRP
- Ryan Sterling, PhD
- Lauren Stevenson, PhD
- Soumya Subramaniam, MPH
- Edwin Wong, PhD

We would also like to thank the staff at the Lovell FHCC, Jesse Brown VAMC, and Columbus VAMC for their participation.

## II. Manuscripts based on the EMPIRIC evaluation

Rucci JM, Ball S, Brunner J, Moldestad M, Cutrona SL, Sayre G, Rinne S. "Like One Long Battle:" Employee Perspectives of the Simultaneous Impact of COVID-19 and an Electronic Health Record Transition. J Gen Intern Med. 2023 Oct;38(Suppl 4):1040-1048. doi: 10.1007/s11606-023-08284-3. Epub 2023 Oct 5. PMID: 37798583; PMCID: PMC10593661.

Ahlness EA, Orlander J, Brunner J, Cutrona SL, Kim B, Molloy-Paolillo BK, Rinne ST, Rucci J, Sayre G, Anderson E. "Everything's so Role-Specific": VA Employee Perspectives' on Electronic Health Record (EHR) Transition Implications

for Roles and Responsibilities. J Gen Intern Med. 2023 Oct;38(Suppl 4):991-998. doi: 10.1007/s11606-023-08282-5. Epub 2023 Oct 5. PMID: 37798577; PMCID: PMC10593626.

Molloy-Paolillo B, Mohr D, Levy DR, Cutrona SL, Anderson E, Rucci J, Helfrich C, Sayre G, Rinne ST. Assessing Electronic Health Record (EHR) Use during a Major EHR Transition: An Innovative Mixed Methods Approach. J Gen Intern Med. 2023 Oct;38(Suppl 4):999-1006. doi: 10.1007/s11606-023-08318-w. Epub 2023 Oct 5. PMID: 37798584; PMCID: PMC10593729.

Ahlness EA, Molloy-Paolillo BK, Brunner J, Cutrona S, Kim B, Rinne ST, Walton E, Wong E, Sayre G. “It’s like a chore to stay here”: Mixed methods analysis of Health Professions Trainee experience during an electronic health record transition. J Gen Intern Med. In press

Ahlness EA, Molloy-Paolillo BK, Brunner J, et al. Impacts of an Electronic Health Record Transition on Veterans Health Administration Health Professions Trainee Experience. J Gen Intern Med. Published online October 5, 2023. doi:10.1007/s11606-023-08283-4

Ball SL, Rucci JM, Molloy-Paolillo BK, Cutrona SL, Brunner J, et al. “For the first time…I am seriously fighting burnout”: Clinician and staff experiences with an EHR transition. JAMIA Open 2024 Jul 15;7(3):ooae067. doi: 10.1093/jamiaopen/ooae067. PMID: 39011033; PMCID: PMC11249389

Ball SL, Kim B, Cutrona SL, Molloy-Paolillo BK, Ahlness E, Moldestad M, Sayre S, Rinne ST. Clinician and staff experiences with frustrated patients during an electronic health record transition: a qualitative case study. BMC Health Serv Res 24, 535 (2024). https://doi.org/10.1186/s12913-024-10974-5

Anderson, E, Moldestad, M, Brunner, J, Ball, S, Helfrich, C, Orlander, J, Rinne, S, Sayre, G. User Experiences of Transitioning from a Homegrown Electronic Health Record to a Vendor-Based Product in the Department of Veterans Affairs: Qualitative Findings from a Mixed Methods Evaluation. JMIR Formative Research 2024, 8, e46901. Published online 9/10/2024. https://doi.org/10.2196/46901

## III. References

1. Huang C, Koppel R, McGreevey JD, 3rd, Craven CK, Schreiber R. Transitions from one electronic health record to another: challenges, pitfalls, and recommendations. Appl Clin Inform. Oct 2020;11(5):742-754. doi: 10.1055/s-0040-1718535
2. Abramson EL, Patel V, Malhotra S, Pfoh ER, Osorio SN, Cheriff A, et al. Physician experiences transitioning between an older versus newer electronic health record for electronic prescribing. Int J MedInfor. 2012; 81(8):539-48.
3. Barnett ML, Mehrotra A, Jena AB. Adverse inpatient outcomes during the transition to a new electronic health record system: observational study. BMJ. 2016;354:i3835.
4. Scott JT, Rundall TG, Vogt TM, Hsu J. Kaiser Permanente's experience of implementing an electronic medical record: a qualitative study. BMJ. 2005;331:1313-16.
5. Hanauer DA, Branford GL, Greenberg G, et al. Two-year longitudinal assessment of physicians' perceptions after replacement of a longstanding homegrown electronic health record: does a J-curve of satisfaction really exist? J Am Med Inform Assoc. 2017 Apr 1;24(e1):e157-e165. doi:10.1093/jamia/ocw077
6. Ellingsen G, Hertzum M, Melby L. The tension between national and local concerns in preparing for large-scale generic systems in healthcare. Computer Supported Cooperative Work (CSCW). 2022;16:1-31

7. Peckham C. Medscape EHR Report 2016: physicians' rate top EHRs. *Medscape Business of Medicine*. August 25, 2016. Available from: https://www.medscape.com/features/slideshow/public/ehr2016
8. Elo S, Kyngas H. The qualitative content analysis process. Journal of Advanced Nursing. Apr 2008; 62(1): 106-115. https://doi.org/10.1111/j.1365-2648.2007.04569.x
9. US Department of Veterans Affairs. VA Central Ohio Healthcare System [Internet]. Available from: https://www.va.gov/central-ohio-health-care/about-us/
10. Agency for Healthcare Research and Quality. Health IT patient safety supplemental items for hospital SOPS [Internet]. 2018 [updated Mar 2022; cited 2022 Dec 20] Available from: https://www.ahrq.gov/sops/surveys/hospital/supplemental-items/health-it.html
11. Brooke J. SUS-A quick and dirty usability scale. Usability evaluation in industry. 1996;189(194):4-7.
12. Helfrich CD, Li YF, Sharp ND, Sales AE. Organizational readiness to change assessment (ORCA): development of an instrument based on the Promoting Action on Research in Health Services (PARIHS) framework. Implementation science. 2009;4(1):1-3.
13. Linzer M, Poplau S, Babbott S, Collins T, Guzman-Corrales L, Menk J, et al. Worklife and wellness in academic general internal medicine: results from a national survey. Journal of general internal medicine. 2016 Sep;31(9):1004-10.
14. Shea CM, Jacobs SR, Esserman DA, Bruce K, Weiner BJ. Organizational readiness for implementing change: a psychometric assessment of a new measure. Implementation science. 2014;9(1):1-15.
15. US Department of Veterans Affairs. VA All Employee Survey - National Center for Organization Development [Internet]. Available from: https://www.va.gov/NCOD/VAworkforcesurveys.asp