

# Improving Cervical Cancer Screening Rates at an Urban Federally Qualified Health Center Family Medicine Residency Clinic

*Ecler Jaqua, MD, FAAFP; Van Nguyen, DO, FAAFP; Kelly Morton, PhD; Elysia Chin, DO; Andrew Brougher, MD; Jhanelle Dawes, MD*

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## Abstract

**BACKGROUND:** Family medicine residency clinics and underserved Federally Qualified Health Center clinics often have lower rates of cervical cancer screening (CCS).

**METHODS:** A series of resident-run, team-based quality improvement projects were conducted to iteratively improve CCS rates in an urban Federally Qualified Health Center in a high-need and high-demand region.

**RESULTS:** The authors were able to improve CCS rates from 52.2% to 66.3% through 6 quality improvement projects.

**CONCLUSION:** Improving the clinical workflows and systems to promote better rates of CCS likely requires a series of changes, however, promoting CCS in the usual clinic workflow, regardless of the reason for visit, demonstrated the greatest gains in CCS in our setting.

### Corresponding Author

Ecler Jaqua, MD, FAAFP  
ejaqua@llu.edu

### Author Affiliations

Loma Linda University Health,  
Family Medicine Department,  
Redlands, CA, USA

### Author Contributions

Ecler Jaqua, MD, DipABLM, DipABOM, FAAFP, wrote and edited the paper; Van Nguyen, DO, DipABOM, FAAFP, wrote and edited the paper; Kelly Morton, PhD, MA, performed data analysis, wrote, and edited the paper; Elysia Chin, DO, contributed data or analysis tools and wrote the paper; Andrew Brougher, MD, contributed data or analysis tools and wrote the paper; Jhanelle Dawes, MD, collected the data and contributed data or analysis tools.

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## Introduction

Until the introduction of the Papanicolaou test in the 1920s, cervical cancer (CC) was the leading cause of cancer-related death in the United States.<sup>1</sup> Following the widespread implementation of the Papanicolaou test, a 70% reduction in CC-related deaths occurred by the 1990s.<sup>1</sup> With early screening, diagnosis, and treatment, the United States reports CC as the 13th highest incidence and 12th highest cancer-related death rate compared with the fourth incidence and second cause of death worldwide.<sup>2</sup> In recent years, cervical cancer screening (CCS) rates have plateaued despite the

introduction of human papilloma virus screening with the Papanicolaou test. This is of interest because CC disproportionately affects low-income, low-health literacy, and racial/ethnic minority women.<sup>3</sup> CC diagnoses and diagnoses at advanced stages are higher for Black and Hispanic women. In addition, California has new CC rates higher than those nationally (8 vs 7.4 per 100,000 women in 2018).<sup>4</sup>

Further, our local community demographics indicate major, urgent health needs and economic depression in our diverse, medically underserved patient population in our residency clinic based in a

Federally Qualified Health Center (FQHC), which is the second largest in the nation.<sup>5</sup> Our community demographics include: 53.4% Hispanic/Latino, 42% non-English-speaking, 20.8% without a high school degree, and 18% living below the poverty line.<sup>6,7</sup> Similar US FQHC-based sites in the nation report 55% CCS rates compared with 80% for non-Medicaid insurance patient populations.<sup>8</sup> Thus, an FQHC is an optimal setting to address CCS health disparities and creates a backdrop to test clinical improvement strategies.

## Objectives

This series of 6 quality improvement (QI) projects aimed to increase CCS rates in an urban FQHC family medicine residency clinic that serves 62% Hispanic/Latina and Black women. CCS rates for FQHCs in California, and nationally, are 57% and 54%, respectively, which are both higher than the baseline FQHC family medicine residency CCS rate of 52.2%. The QI projects addressed the following barriers as reported in previous literature: structural workflow in clinic,<sup>9,10</sup> decision support to physicians,<sup>11,12</sup> addressing health literacy with patient education regarding CCS,<sup>13-18</sup> demonstrating cultural sensitivity by offering a female physician for CCS regardless of the assigned visit physician,<sup>9</sup> and addressing transportation difficulty by offering same-day CCS regardless of reason for clinic visit. Thus, between 2018 and 2020, before the COVID-19 pandemic, six 4-month resident-led Plan-Do-Study-Act (PDSA) cycles were conducted with an aim to improve CCS by 5% with each cycle. The larger goal was to improve CCS to the 90th percentile of CCS of 71% as established by Medicaid HMO P4P and HEDIS.

## Methods

This study was performed between June 2018 and January 2020, using 4-month PDSA cycles. The project team included resident physicians, attending physicians, licensed vocational nurses, and medical assistants (MAs). The project team included interns, residents, faculty, licensed vocational nurses, and MAs. The interventions were chosen by the new senior resident team leaders at the beginning of the 4-month PDSA cycle. The rest of the team assisted with intervention implementation and literature review. Each intervention was layered on the previous interventions as no one was asked to stop doing an intervention after 4 months. However, if an

intervention did not demonstrate increased CCS or was rated as unsatisfactory by the clinic members (eg, residents and MAs), it was not continued in the workflow. Of the interventions made, the most successful interventions were decision support, communicating effectively with the patient, and offering CCS with patient education at every visit with a gender-matched physician regardless of reason for visit.

The entire clinical population of women in the family medicine residency clinic were in the denominator for the CCS. This denominator would fluctuate over time based on how many women enrolled in the clinic and how many individual women were due for screening based on their health maintenance tab completion. Only screenings performed in our FQHC or in related organizations sharing the electronic medical records (EMR) at the county and academic medical center campus would count as screened. The population of the clinic included approximately 1480 women who were seen within a calendar year in at least 1 of the FQHC clinics. The patient would count toward the denominator regardless of when a woman she was due for screening. However, the denominator would change at each cycle based on enrollment and being present for at least 1 clinic visit in the system that calendar year to be counted in the Uniform Data System (UDS) measurement.

During the earlier PDSA cycles (cycles 1 to 3), data were collected manually by attending physicians and ancillary staff. Later PDSA cycles (cycles 4 to 6) used the UDS for data collection. The UDS was able to identify women more accurately in the Social Action Community Health System Family Medicine clinic who were eligible for CCS, excluding women who did not require CCS, such as women with a history of hysterectomy for noncancer-related diseases and/or hospice status.

The FQHC secured adequate support staff (ie, MAs, schedulers, patient service representatives) and supplies (ie, speculum lights, bariatric examination tables, specimen collection tools) to ensure the ability of the resident physicians to complete CCS. The clinic staff and resident physicians were educated about the importance of CCS and how to effectively communicate this to their patients. The EMR health maintenance function was utilized to indicate when a CCS was due.

CCS processes at the FQHC were critically analyzed using root cause analysis, process flow, and run charts after each intervention. Each identified

barrier to CCS was addressed in a 4-month PDSA cycle. The CCS workflow presented in Figure 1 evolved over the course of the PDSA cycles as the teams realized which interventions were effective and satisfactory to the team members. Each cycle reexamined the workflow and made further refinements based on feedback from team members. In addition, MAs and residents were surveyed regarding the acceptability of the interventions and suggestions for refinement. The main outcome measure was percentage of the eligible patient panel screened for CC. The process measures were 1- to 3-item online surveys of resident physicians' and MAs' knowledge of and use of the interventions of that PDSA cycle. The balancing measures were 1- to 3-item online surveys of resident physicians' and MAs' satisfaction with the intervention of that PDSA cycle with open-ended comments. These data were reviewed and considered when advancing to the next PDSA cycle to better refine the interventions and workflows. The interventions developed during each PDSA cycle were:

1. After-visit Summary (AVS) Patient Education/Schedule CCS: EMR AVS provides CCS education; patient asked to make a follow-up appointment if CCS is due
2. Resident CCS Dashboard/MA Offers: CCS offered to eligible patient regardless of reason for visit and manual resident dashboard indicates CCS rates (difficult to maintain)
3. MA Orders Records and Offers CCS Scheduling: MA notifies patient and resident CCS is due while ordering records if patient believes screening has already been completed elsewhere
4. Team Huddle to Offer CCS: Optimize health care team communication in the huddle regarding CCS needs for patients on the schedule for that clinic half-day (see Figure 1)
5. Team Huddle and Offer Female Physician: Patient is educated and offered a female physician (attending or other resident) if matches patient preference, so CCS is completed at clinic visit

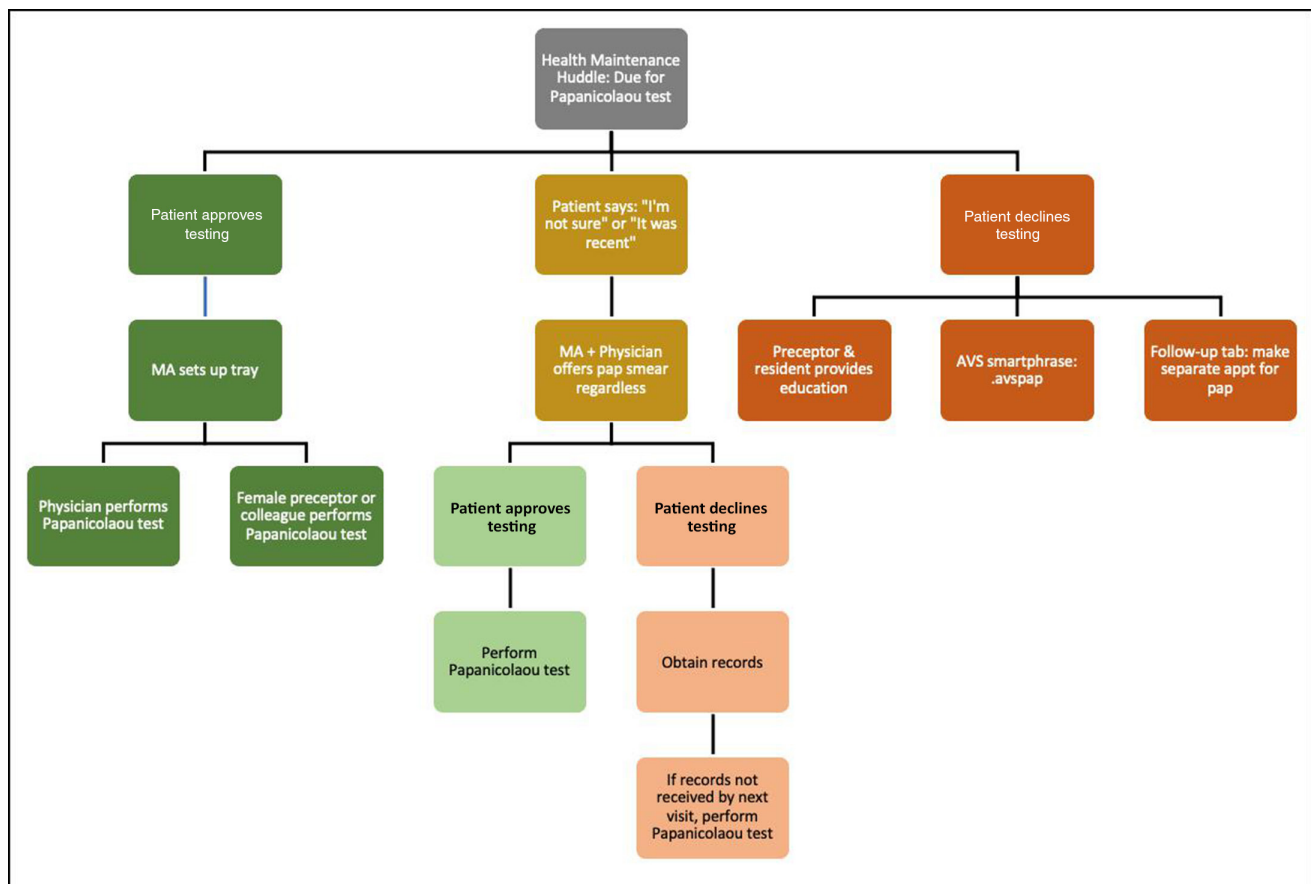
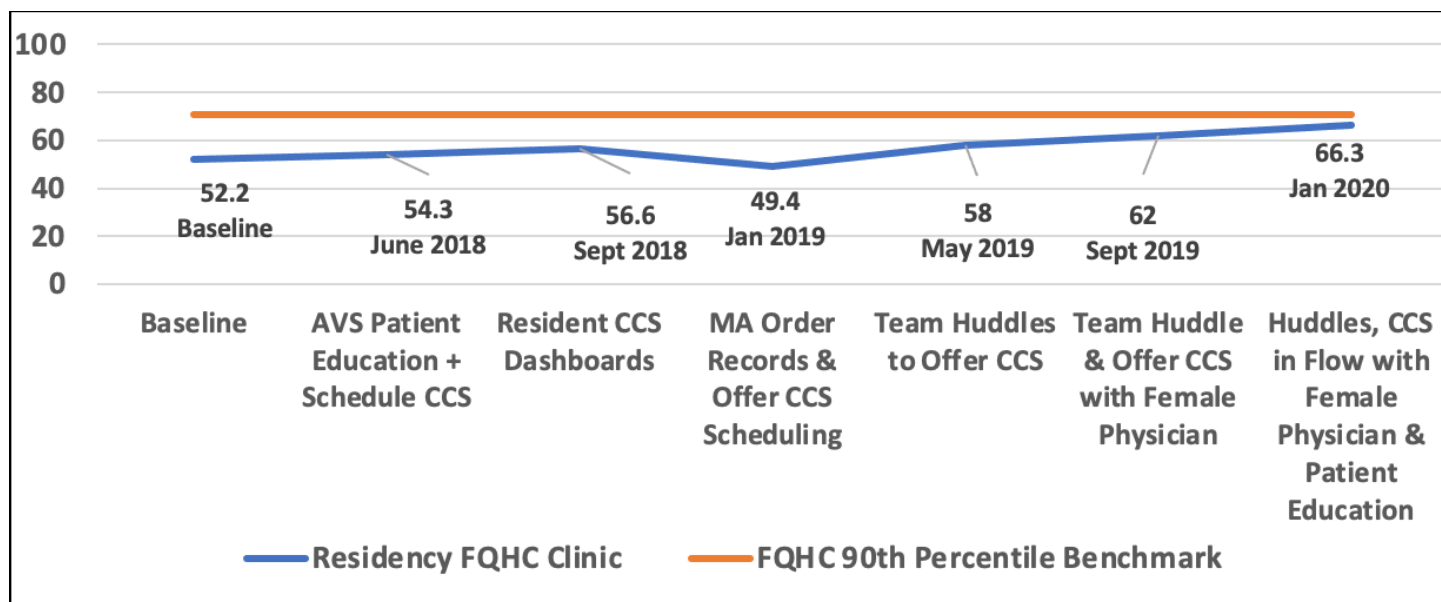


Figure 1: Cervical cancer screening workflow. AVS = after-visit summary; MA = medical assistant.



**Figure 2:** Federally Qualified Health Center (FQHC) family medicine residency clinic cervical cancer (CCS) screening rates across quality improvement cycles. AVS = after-visit summary; MA = medical assistant.

- Huddles, CCS in Flow with Female Physician, and Patient Education: EMR AVS for CCS education, and attending/resident physician provides CCS education at every visit, huddles and offers for CCS in flow with female physicians if requested by patient.

## Results

Figure 2 shows the rates of CCSs across the 6 PDSA cycles with baseline screening well below the Medicaid HMO P4P and HEDIS 90th percentile benchmark of 71% CCS; we approached this level by the end of cycle 6. First, CCS increased by 2.1% when we added CCS patient education in the AVS and encouraged scheduling a return visit. Second, we increased CCS by 2.3% when we added resident CCS dashboards and encouraged same-visit screening. Third, we decreased CCS by 7.2% when we asked staff to order medical records for CCS. Patients were either mistaken about CCS occurring (eg, a different pelvic exam procedure) or records were inefficiently received and integrated into the EHR. Fourth, we increased CCSs by 8.6% by having the staff and residents huddle and offer CCS in each visit. Fifth, we increased CCS by 4% with huddles and offering a female physician in the clinic visit regardless of reason for visit and visiting physician. Finally, we increased CCSs by 4.3% by using all previous successful interventions (huddles, female physicians, same-day CCS regardless of reason for visit) and adding additional patient education.

## Discussion

### OVERVIEW

We built on QI successes and used lessons learned to refine the CCS interventions to approach the national benchmark levels between September 2019 and January 2020. Although there was a difference in data collection between the earlier and later cycles, Figure 2 illustrates the steady increase in CCS at Social Action Community Health System Family Medicine clinic. We increased CCS rates from 52.2% to 66.3%, an increase of 14.1% in a residency clinic that typically has difficulty with continuity of care and CCS. We learned clearly that this kind of improvement needs to slowly refine clinical processes and workflows to support screening and involve all staff and resident physicians as change agents. By cycle 6 we were able to sustain and maintain team-based huddles, same-day CCS with patient-preferred physician gender match, as well as enhanced patient education resources and counseling. During the same time period in the same FQHC site, the internal medicine residency clinic had 48% CCS, the women's health residency clinic had 68% CCS, and the family medicine faculty clinic at an FQHC satellite clinic in the same city achieved only 48% CCS. It is clear that for our patient population, our adjusted workflows and policies had a positive influence that allowed a primary care clinic to achieve a relatively high screening rate that approached the levels of the women's health clinic. We know that our workflows were helpful because

the other similar primaFry care clinics in our same system did not have similar elevations in CCS during the same time period. When video visits became the norm, most clinics in our system experienced decreases in CCS, including our own clinic, so this change was not sustained during the pandemic when in-person visits were reduced to about 30% of visits overall.

### LIMITATIONS

The UDS measure in an FQHC resets the patient population each year to examine only patients who present at a clinic visit at any time in that calendar year. Therefore, as women matriculate into the clinics across the FQHC sites, they are eligible to be considered for CCS measurement. This allows a clinic to have the opportunity to deliver preventive care effectively. The FQHC conducts outreach to encourage a patient population to be seen for preventive care, but until the patient arrives at least once in the system, they are not considered in the denominator for CCSs. Although we have only examined them in 1 clinic and compared the changes to other clinics in our large FQHC system, these interventions may generalize to other non-FQHC clinics. Future projects could apply these same workflows and interventions in other primary care clinics to assess sustainability and success of improving CCS rates. Unfortunately, this will only be possible when in-person visit rates reach normal levels after the pandemic.

### INTERVENTION SELECTION

PDSA cycles 1 to 4 had independent interventions to increase CCS. Cycle 5 incorporated all previous successful interventions, attempting a more multimodal approach to CCS. It was in this cycle that CCS rates increased and a more sustainable process for increasing CCS rates was established. Future projects should build on a comprehensive approach to increasing CCS in a clinic setting that provides care for underserved patient communities.

### MULTIFACETED APPROACH

The most practical and useful interventions were providing early CCS to all eligible women if outside records were not immediately available, having CCS planned and offered in advance to reduce clinic cycle time, having a female physician available if requested by a patient, and providing adequate patient education. Our rates began to consistently increase after we offered CCS without ordering outside medical records and using team-based care approaches. This finding aligns with current research that the absence of an established source

of health care negatively affects CCS rates and to plan screening accordingly.<sup>19,20</sup> Because patients at the FQHC do not often have an established medical home, obtaining records delayed CCS for most patients. This finding highlights how a fragmented health care system is a major barrier to cost-effective, patient-centered care.<sup>21</sup>

### PATIENT EDUCATION

Understanding the importance of CCSs is critical to improve the early detection of CC. A patient's poor understanding of CC and fear or embarrassment about the exam are 2 of the greatest barriers to CCSs.<sup>21-24</sup> Some studies report a large portion of women who have yet to learn about CCSs and that CC is treatable if diagnosed early.<sup>25,26</sup> Likewise, it has been noted that adequate knowledge about CC is directly proportional to screening rates.<sup>22,27</sup>

Patient education and health literacy were addressed in cycles 5 and 6. Although it was a part of the workflow for a clinician to explore the reasons for declining CCS, the approach was variable across clinicians. Future directions may include creating formal education about promoting screening. Though cycle 6 included an informational handout, social media campaigns, and participation in a community health fair, the cycle also included the refinements in the clinical workflow, so it is difficult to know which aspect truly increased the screening rates. It is likely that a multifaceted approach to clinical operations and patient education are needed to improve CCS rates, especially in low-income populations.<sup>20</sup> These modalities are all imperative to counseling women about CC and the potential available resources.<sup>25,28</sup>

Due to the success of the comprehensive intervention, we were able to sustain the changes and continue to improve CCS rates by training and educating all the residents, clinical staff, and faculty. However, after our project was completed, the CCS rate decreased during the COVID-19 pandemic. According to the Centers for Disease Control and Prevention, the total number of CCS tests in the United States decreased by 84% in April 2020 compared with previous years.<sup>29</sup>

## Conclusion

CC remains a global health concern, particularly for low-income and minority women. Barriers to CCS were noted on patient, clinician, and systems levels. With a streamlined workflow and



multifaceted approach to patient education, we improved CCS rates to nearly the 90th percentile benchmark for FQHCs. In-depth patient education, interdisciplinary collaboration, EMR technology, and improved communication among the health care team and patients were essential to success. Continued efforts of streamlining workflow, accurate data collection, and expanded patient education can improve health literacy and diminish the health disparity noted among an underserved community who are often cared for by a residency-based clinic or FQHC. Future interventions, such as dedicated CCS days to increase access with population-based outreach and CCS self-collection to alleviate potential fear and embarrassment of the exam while providing the convenience of at-home testing, should be explored.<sup>27,30</sup> Moreover, a similar systematic approach involving huddles with staff, patient education, and innovation surrounding clinic access may improve other preventive screenings such as for breast and colon cancer.

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