IMPLEMENTING CERVICAL CANCER SCREENING GUIDELINES AT A COMMUNITY HEALTH CENTER: A QUALITY IMPROVEMENT PROJECT

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Abstract

Cervical cancer remains a significant health concern worldwide, affecting over 500,000 individuals. Despite great progress towards its elimination, many healthcare providers have substantial knowledge gaps and are unaware of and do not follow current screening guidelines. The purpose of this quality improvement project was to decrease the incidence of preventable cervical cancer among Wahiawā Center for Community Health patients by increasing the rate of guideline-adherent screening. To achieve this, the project had two objectives: (1) increase awareness and understanding of cervical cancer screening and management guidelines among providers, medical assistants, and patient service representatives, and (2) increase patient understanding of pelvic exams, cervical cytology, human papillomavirus testing, and human papillomavirus' link to cervical cancer. A multi-pronged approach was employed, consisting of two tailored educational presentations, a "cheat sheet," a patient education handout, and a demonstration of the American Society for Colposcopy and Cervical Pathology management website. Post-tests were administered immediately after participation in the educational presentations and 8 weeks later. The response rate ranged from 35% to 67%. Providers, medical assistants, and patient service representatives showed high accuracy immediately after participation in the educational presentations and high knowledge retention after 8 weeks. However, some knowledge loss was observed, particularly regarding cervical cancer screening intervals. The proxy measure for patient understanding indicated that the patient education handout was effective. Due to the long natural history of cervical cancer, long-term surveillance of clinic data is needed to assess the project's impact on cervical cancer incidence.

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Implementing Cervical Cancer Screening Guidelines at a Community Health Center: A Quality Improvement Project

The American Cancer Society (ACS) released updated cervical cancer screening guidelines in 2020 and, likely, guidelines from the U.S. Preventive Services Task Force (USPSTF) and the American College of Obstetricians and Gynecologists (ACOG) will move in a similar direction (Perkins et al., 2021). As of May 2023, the USPSTF cervical cancer screening guidelines are being updated (U.S. Preventative Services Task Force, 2021). However, only 50%-70% of providers follow cervical cancer screening guidelines (Tatar et al., 2020). The primary reasons for non-adherence are a lack of knowledge and fear of missing a positive screening (Slomski, 2020; Tatar et al., 2020). The biggest difference in the revised ACS guideline is that it now recommends commencing cervical cancer screening at age 25 and the preferred method is primary human papillomavirus (HPV) testing alone every five years (Perkins et al., 2021). This is a big shift from the current standard of beginning screening at age 21 with a Papanicolaou (Pap) test every three years; however, the recommendations are based on the current body of evidence. Some of the reasons for the changes are that many women aged 21-24 are vaccinated against HPV and, thus, are less likely to develop cervical dysplasia. Further, over-screening can lead to harm, such as unnecessary biopsies that can leave scarring on the cervix. Other countries around the globe have already made the same or similar changes to their guidelines, such as most European countries, Australia, and Canada (Slomski, 2020).

Wahiawā Center for Community Health (WCCH) is a designated Federally Qualified Health Center (FQHC) Look-Alike located in Wahiawā on the island of Oʻahu, Hawaiʻi. WCCH offers comprehensive primary care, including women's health, men's health, behavioral health, and pediatric health (Wahiawa Health, n.d.). WCCH serves a predominantly Native Hawaiian

and Pacific Islander population (26%) and nearly half (48%) of patients have Medicaid (Health Resources & Services Administration, n.d.-a). WCCH's rate of guideline-adherent cervical cancer screening from March 15, 2021 through March 14, 2022 was 56%. This is slightly above the national health center rate of 51% (Health Resources & Services Administration, 2022) and above the average rate (46%) for all FQHC in Hawai‘i (Health Resources & Services Administration, n.d.-b). However, it is far below the Healthy People 2030 target of 84% (Department of Health and Human Services, n.d.). WCCH's leadership identified improving the clinic's cervical cancer screening rate as an important initiative and this was the focus of this Doctor of Nursing Practice (DNP) evidence-based quality improvement (QI) project.

Needs Assessment

As a preliminary step, a needs assessment was conducted to determine WCCH's current processes and desired outcomes for the QI project. The author and the chairperson developed an interview script (Appendix A). Semi-structured in-person interviews were conducted on March 14, 2022 at WCCH with key stakeholders identified by clinic leadership. Field notes were collected during the informal interviews and the qualitative data were summarized.

The priority need that emerged from the qualitative interview data was the need for increased knowledge among clinic providers, medical assistants (MAs), patient service representatives (PSRs), and patients on the various cervical cancer screening tests, their respective intervals, and the management of abnormal results. The stakeholders explained that patients are frequently referred from the Family Medicine Clinic to the Women's Health Clinic for cervical cancer screening before they are due. The MA confirms cervical cancer screening eligibility for all upcoming patient appointments. When a patient is not due for screening, the MA then calls the patient to inform them that they will not need cervical cancer screening, but

can still come for an annual pelvic exam. This causes unnecessary work for the MAs and dissatisfaction and confusion among patients.

A lack of patient education and patient misunderstanding about cervical cancer screening was also identified as a priority area for intervention. It was expressed that many patients (1) confound Pap tests (i.e., cervical cytology) with pelvic exams, (2) are under the impression that they should have a Pap test annually, (3) do not understand the need for an annual pelvic exam, and (4) do not understand what HPV is and its link to cervical cancer. Finally, the stakeholders explained that they utilize the management recommendations provided in the Clinical Laboratories of Hawaii (CLH) cytology reports. CLH's pathologist, Dr. Jeffrey Killeen, stated that their recommendations are based on the 2019 American Society for Colposcopy and Cervical Pathology (ASCCP) guidelines (personal communication, March 22, 2022). However, he admitted that following these guidelines can become complex and, though they do their best to follow them, CLH's recommendations may vary from those obtained from the ASCCP mobile application or website.

Background

Despite significant progress in recent years towards the elimination of cervical cancer, the disease still affects over 500,000 individuals worldwide (Buskwofie, David-West, & Clare, 2020). Cervical cancer rarely affects those younger than 20 years of age, with an average age at diagnosis of 50 (The American Cancer Society, 2022). In the US in 2018, 12,733 women were newly diagnosed with cervical cancer, and 4,138 women died from it (U.S. Cancer Statistics Working Group, 2021). This is a staggering number considering that cervical cancer is preventable through primary and secondary prevention strategies. Cervical cancer is a slow-growing cancer caused by persistent HPV infection.

As our understanding of cervical cancer evolves and technology continues to advance, better forms of primary and secondary prevention will be developed. At present, primary HPV testing is superior to Pap testing. The ACS 2020 guidelines recommend HPV testing every five years as the preferred method of screening. However, many providers are unaware of the new guidelines and have substantial knowledge gaps regarding HPV testing.

HPV

HPV is an extremely common sexually transmitted virus (Centers for Disease Control and Prevention, 2019c). Most HPV infections have no symptoms and resolve on their own; however, some HPV infections can lead to cancer and warts (World Health Organization, 2020). There are over 100 types of HPV; at least 14 types are known to cause cancer (World Health Organization, 2020). Over 95% of cervical cancer is caused by HPV, with nearly three-quarters (70%) of all cervical cancers and pre-cancerous lesions caused by types 16 and 18 (World Health Organization, 2020). Cervical cancer is slow-growing, taking an average of 15-20 years to develop (World Health Organization, 2020).

Primary Prevention: Vaccination

HPV vaccines were first approved in the US in 2006. Currently, there is one HPV vaccine available in the US: Gardasil 9 (American Cancer Society, 2020; Centers for Disease Control and Prevention, 2019b). This vaccine is very safe and very effective in protecting against the HPV strains most likely to cause cancer and genital warts (i.e., types 16, 18, 6, 11, 31, 33, 45, 52, and 58) (Centers for Disease Control and Prevention, 2019b).

The Centers for Disease Control and Prevention (2019c) recommends that all boys and girls receive the HPV vaccine between the ages of 11 and 12. The HPV vaccine can be received as young as nine years old and is recommended up to 26 years old (Centers for Disease Control

and Prevention, 2019c). The vaccine may be given to people aged 27-45 with shared clinical decision-making with their healthcare provider (Centers for Disease Control and Prevention, 2019a; Food and Drug Administration, 2018). The vaccine is most effective when it is administered at a young age, prior to puberty, and before a person's first sexual activity (Centers for Disease Control and Prevention, 2019a). Long-term immunogenicity is better in those who initiated vaccination between the ages of 9 and 15 compared to those who initiated vaccination at age 16 or older (Olsson et al., 2020). A recent systematic review and meta-analysis showed that HPV vaccination can also benefit individuals who already have cervical dysplasia (Lichter et al., 2020). After having the precancerous cells excised, HPV vaccine administration reduced the likelihood of recurrence (Lichter et al., 2020).

Pediatric and adult primary care settings, gynecologic settings, and any setting that provides sexually transmitted infection (STI) services can administer the HPV vaccine (Planned Parenthood, n.d.). Most insurance plans will cover the cost of HPV vaccination (American Cancer Society, 2020). HPV vaccines are also available for free to eligible children and adolescents through the Vaccines for Children (VFC) program (Centers for Disease Control and Prevention, 2014). For uninsured people aged 19–45 years who meet certain income criteria, there is an assistance program available from Merck, the vaccine manufacturer (Merck Sharp & Dohme Corporation, 2020).

In Hawai‘i, 61% of adolescents aged 13-15 have received the HPV vaccine (Hawaii Health Data Warehouse & Hawaii Department of Health, 2021). While Hawai‘i's adolescent vaccination rate is better than the national rate of 52%, it is below the Healthy People 2030 target of 80% (Hawaii Health Data Warehouse & Hawaii Department of Health, 2021).

Secondary Prevention: Screening

Pap test. The Pap test, also referred to as cervical cytology, is a screening test that detects cellular changes on the cervix indicative of cancer or precancer (Tan & Tatsumura, 2015). The test was named after Dr. George Nicholas Papanicolaou, who published his discovery in 1928 that differences between the cytology of normal and malignant cervical cells can be detected by viewing swabs smeared on slides under a microscope (Tan & Tatsumura, 2015). Technology has continued to advance and, in the mid-1990s, liquid-based cytology was introduced (Çelik, Gezginç, Toy, Findik, & Yilmaz, 2008). Since the Pap test's introduction as a screening tool in the mid-twentieth century, death rates from cervical cancer have decreased by at least 70% in the US (Buskwofie, Chan, Kahn, & Holcomb, 2019; Chrysostomou, Stylianou, Constantinidou, & Kostrikis, 2018).

HPV test. The HPV test is a newer test that detects the presence of HPV deoxyribonucleic acid (DNA) in cervical cells. It can be used as primary screening alone, primary screening in conjunction with a Pap test (i.e., co-testing), or as a second test after an abnormal Pap test result (i.e., triage or reflex testing). HPV testing is superior to Pap testing, offering higher sensitivity and earlier detection of cervical dysplasia (Chrysostomou & Kostrikis, 2020; Ronco & Rossi, 2018; Slomski, 2020). HPV testing every five years, compared to cytology testing every three years, has the potential to lead to fewer cases of cervical cancer and reduced costs to the health care system.

Problem Statement

This DNP project, guided by recent evidence and the needs assessment, addressed provider, MA, PSR, and patient knowledge gaps regarding the changing cervical cancer screening and management guidelines and the important role of HPV testing. Nationwide, there

is widespread guideline non-adherence and misconceptions about HPV testing among primary care providers (Benard et al., 2016; Tatar et al., 2020). The needs assessment revealed that WCCH providers, MAs, PSRs, and patients could benefit from education regarding cervical cancer, the various screening tests and their respective testing intervals, and the latest screening and management guidelines. It is important to correct misconceptions and knowledge gaps, as provider recommendation is a key factor for patients deciding to undergo cervical cancer screening (Thompson et al., 2020).

PICOT

Does primary care provider, MA, and PSR participation in an educational intervention regarding current cervical cancer screening and management guidelines increase guideline-adherent screenings of patients in an FQHC look-alike primary care clinic compared to the current standard of care over a two-month period?

Purpose and Objectives

The purpose of this project was to decrease the incidence of preventable cervical cancer among WCCH patients. To achieve this, the project's objectives were as follows:

1. Increase awareness and understanding of cervical cancer screening and management guidelines among providers, MAs, and PSRs.
2. Increase patient understanding of pelvic exams, Pap and HPV tests, and HPV's link to cervical cancer.

To address Objective 1, I implemented a multi-pronged intervention, utilizing education and multiple calls to action. I (1) created an evidence-based educational intervention consisting of two PowerPoint presentations, one tailored to and disseminated among providers and the other tailored to and disseminated among MAs and PSRs; (2) created a "cheat sheet" for providers,

MAs, and PSRs to keep by their computers and refer to when unsure of screening test parameters or abnormal results management; (3) ensured appropriate providers, MAs, and/or PSRs were registered on the ASCCP management website; and (4) ensured appropriate providers, MAs, and/or PSRs added computer shortcuts to this website. To address Objective 2, I created an educational handout for patients.

Both the provider group and the MA/PSR group (i.e., support staff) completed two post-tests: one immediately after participation in their respective educational intervention and one 8 weeks later. The provider immediate post-test assessed case-based knowledge and intended behavior. The provider 8-week post-test assessed behaviors over the past month and perceived usefulness of the materials. The support staff immediate post-test assessed content knowledge. The support staff 8-week post-test determined knowledge retention and perceived usefulness of the materials. The post-tests consisted of questions that have been used in the chairperson's line of research. The objective of the educational intervention was to increase provider and support staff knowledge and intent to recommend appropriate cervical cancer screening, with a target of 90% accuracy at post-test. It is important to keep the long-term goal – decreasing the incidence of preventable cervical cancer – in mind, although its measurement is beyond the scope of this project. The logic model (Table 1) lists the project's inputs, activities, outputs, objective, short-term goal, medium-term goal, and long-term goal. The Gantt chart (Table 2) lists the project's specific, measurable, achievable, realistic, and time-bound (SMART) objections; action plan; and timeline.

Table 1

Logic Model

Inputs	Activities	Outputs	Objective	Short-term (2 month) goal:	Medium-term (3-7 years) goal:	Long-term (>7 years) goal:
Post-tests Educational materials (i.e., PowerPoint presentations, "cheat sheet," and patient handout) ASCCP management website Clinic provider and support staff computers Clinic provider and support staff participation	Conduct educational presentations with clinic providers and support staff about CCS and management guidelines Place "cheat sheet" on/near clinic provider and support staff computers Register clinic providers and support staff on the ASCCP management website Add shortcuts to the ASCCP management website on clinic provider and support staff computers Provide patient education handout for distribution to patients Providers and support staff to complete post-tests assessing knowledge, behaviors, and perceptions	Clinic provider and support staff participation in the educational intervention Clinic provider and support staff utilization of the "cheat sheet" Clinic provider and support staff registration on the ASCCP management website Clinic provider and support staff utilization of the ASCCP management website Patient receipt of the educational handout Completed post-tests	After participation in the educational intervention (i.e., educational presentation, receipt of "cheat sheet," ASCCP management website registration, ASCCP computer shortcut, and patient educational handout), participants will have 90% accuracy at immediate post-test of their knowledge and intent to offer the right cervical cancer screening method to the right patients at the right time	Providers report offering appropriate CCS in the past month Support staff retain gained knowledge	After an initial rise, colposcopy rate declines	Decreased incidence of preventable cervical cancer

Note. Support staff = MAs and PSRs; CCS = cervical cancer screening

Table 2

Gantt Chart of Project SMART Objectives, Action Plan, and Timeline

	2021				2022													2023			
Process Objectives	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
Locate clinical site with which to partner																					
Perform literature search on evidence-based strategies to improve cancer screening guideline adherence																					
Write final project proposal																					
Oral presentation of project proposal																					
Create evidence-based educational materials and post-tests																					
Conduct educational intervention with 90% of clinic providers and support staff																					
Administer immediate post-tests																					
Administer 8-week post-tests																					
Write final project paper																					
Final oral presentation of DNP project																					
Outcome Objective																					
After participation in the educational intervention, participants will have 90% accuracy at immediate post-test of their knowledge and intent to offer appropriate cervical cancer screening																					

Note. The columns represent months, starting with August 2021 and ending with April 2023; Support staff = MAs and PSRs

Framework

The Iowa Model-Revised was utilized to guide this project (Iowa Model Collaborative, 2017). First, triggering issues and opportunities were identified. There is new evidence demonstrating the superiority of HPV testing over Pap testing. This new evidence has led to new cervical cancer screening guidelines. However, many primary care providers are unaware of the changing guidelines and have knowledge gaps regarding primary HPV testing.

This DNP project addressed the following evaluation question: Does primary care provider, MA, and PSR participation in an educational intervention regarding current cervical cancer screening and management guidelines increase guideline-adherent screenings of patients in an FQHC Look-Alike primary care clinic compared to the current standard of care over a two-month period? Increasing guideline-adherent cervical cancer screening has been identified as a priority for stakeholders within the clinic. Further, it is presumably a priority for providers and patients across the nation.

A project team was formulated and a literature review was performed. Findings from the literature review guided the educational intervention content along with stated goals. The literature review was systematic and appraised and synthesized the current body of evidence.

Next, the practice change was designed and piloted. The design included collecting baseline data (i.e., WCCH's prior cervical cancer screening rate), developing an evaluation plan, preparing educational materials, collecting post-pilot data, analyzing data, and disseminating findings.

If the change proved appropriate for adoption in practice, WCCH may move forward with the remaining steps of the Iowa Model-Revised (e.g., incorporate the educational intervention into new hire training, add shortcuts to the ASCCP management website to all clinic

computers, etc.). If it did not, then the Iowa Model-Revised indicates that the project will revert to a previous step (e.g., redesigning the pilot change, or reassembling and reappraising the body of evidence).

One strength of the Iowa Model-Revised is the inclusion of a pilot/trial prior to full implementation (Schaffer, Sandau, & Diedrick, 2013). The inclusion of a pilot project is particularly useful in healthcare where any number of unexpected patient, organizational, funding, or governmental challenges may arise. Pilot projects can provide helpful information for modifying aspects of the full project and anticipating obstacles, leading to a more efficient full practice change implementation.

Literature Review

The literature review aimed to synthesize the current body of evidence regarding cervical cancer screening implementation.

Search Strategy

Inclusion criteria were (1) articles about cervical cancer screening implementation, (2) published within five years, (3) written in English, (4) focused on high-income countries similar to the US, (5) focused on average-risk patients, and (6) focused on current screening guidelines. In addition, articles were excluded if they focused on non-adherent patient characteristics. Systematic literature searches were conducted on September 8, 2021 in PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). Search terms used were (implement* OR "application" OR "apply" OR translat*) AND ("evidence-based practice" OR "EBP" OR "guidelines") AND ("cervical" AND ("cancer" OR "dysplasia" OR "neoplasm")) AND (screen* OR "secondary prevention"). Filters were applied to include only articles published within the last five years and in English. The searches yielded 171 articles. Each

article's abstract was reviewed. Articles were excluded if they focused on barriers for low- and middle-income countries, focused on patients with higher-than-average risk for cervical cancer, focused on non-adherent patient characteristics, or focused on outdated screening guidelines. This left 31 articles. In addition, five articles were supplied by the chairperson and one article was identified through Tatar et al.'s (2020) article. In total, 37 articles were included in the literature review. The majority of the articles (62%) were descriptive or qualitative studies (i.e., level VI evidence) and opinion of authorities or reports of expert committees (i.e., level VII evidence) (Table 3). Systematic reviews and meta-analyses (i.e., level I evidence) made up 11% of the included articles. The remaining 27% of the articles consisted of levels II-V evidence.

Table 3

Mosby's Level of Evidence and Number of Relevant Articles

Mosby's Level of Evidence	**Number of Articles**	**%**
Level I: Systematic reviews and/or meta-analyses	4	11%
Level II: Well-designed RCTs	1	3%
Level III: Well-designed controlled trials without randomization	3	8%
Level IV: Well-designed case control or cohort studies	3	8%
Level V: Systematic reviews of descriptive and qualitative studies	3	8%
Level VI: Single descriptive or qualitative studies	12	32%
Level VII: Opinion of authorities and/or reports of expert committees	11	30%
Total number of articles	37	100%

Each article was evaluated for focus/purpose, stated methods, sample description, and main findings. Synthesis of the findings is presented below in the following categories: (1) superiority of HPV testing, (2) patient preferences, (3) guideline non-adherence, and (4) barriers to primary HPV test implementation.

Superiority of HPV Testing

Compared to Pap testing (i.e., cervical cytology), HPV testing is more sensitive, can detect anomalies earlier, and is better at detecting adenocarcinoma (Chrysostomou & Kostrikis, 2020; Ronco & Rossi, 2018; Slomski, 2020). Co-testing has increased the detection of cervical intraepithelial neoplasia (CIN) 3+ by two- to three-fold (Buskwofie et al., 2019), with the majority of this increase attributed to the HPV test, not the Pap test (Huh et al., 2015; Wright et al., 2015). A negative HPV test is more reassuring than a negative Pap test (Huh et al., 2015). Individuals with a negative HPV test have only a 0.14% chance of developing CIN 3+ in the next five years (Egemen et al., 2020). It is estimated that a screening strategy that utilizes primary HPV testing every five years, rather than Pap testing every three years, will reduce cervical cancer incidence and mortality in unvaccinated individuals by 31% and 36%, respectively, and in vaccinated individuals by 24% and 29%, respectively (Lew et al., 2017). Further, HPV tests pose few additional risks compared to Pap tests while providing many benefits (Buskwofie et al., 2019).

Sensitivity and specificity. The HPV test is a more sensitive test than cytology (Koliopoulos et al., 2017; Ronco & Rossi, 2018). Both tests have high specificity (Koliopoulos et al., 2017; Ronco & Rossi, 2018). Utilizing a test threshold of atypical squamous cells of undetermined significance (ASCUS+) and a reference-standard threshold of CIN 2+, conventional cytology has a sensitivity of 62.5% and liquid-based cytology has a sensitivity of 72.9% (Koliopoulos et al., 2017). HPV testing, on the other hand, has a sensitivity of 89.9% for identifying CIN 2+ (Koliopoulos et al., 2017).

Utilizing the same test and reference-standard thresholds, conventional cytology has a specificity of 96.6% and liquid-based cytology has a specificity of 90.3% (Koliopoulos et al.,

2017). HPV testing has a specificity of 89.9% (Koliopoulos et al., 2017). Sensitivity and specificity findings were equivalent across those younger and older than 30 years of age (Koliopoulos et al., 2017).

Cost. It is estimated that a screening strategy that utilizes primary HPV testing will be more cost-effective than Pap testing (Buskwofie et al., 2019; Chrysostomou & Kostrikis, 2020; Chrysostomou et al., 2018; Wright et al., 2015), with an estimated overall cost reduction of 19%-26% (Lew et al., 2017). HPV testing costs approximately twice as much as Pap testing. The Centers for Medicare and Medicaid's (CMS) 2021 Quarter 1 Clinical Laboratory Fee Schedule lists Pap test screening as $20.26 and HPV testing for types 16 and 18 as $40.55 (Centers for Medicare & Medicaid Services, 2021). However, HPV testing is recommended every five years, whereas Pap testing is recommended every three years.

One potential issue is that some insurance plans may not cover HPV testing, particularly if the patient is under 30 years of age. Health plans that were in place before the Affordable Care Act (ACA) passed on September 23, 2010 are not subjected to the ACA's mandate to cover cervical cancer screening tests (American Cancer Society, 2019). Currently, the ACA mandates coverage for a Pap test every three years for women aged 21-65 and co-testing (i.e., HPV testing and Pap testing) every five years for women 30-65. The ACA does not mandate coverage for HPV testing for women under the age of 30.

Patient Preferences

Patients wish to receive information about HPV testing from their provider (Nagendiram, Bidgood, Banks, & Heal, 2021; Smith, Hammond, & Saville, 2019) and are significantly more willing to undergo HPV testing if a provider recommends it (Tatar et al., 2020). In addition, many patients prefer self-collection of the HPV test to clinician-collection (Biddell, O'Leary,

Wheeler, & Spees, 2020; Creagh et al., 2021), and the use of this option is primarily driven by providers (Creagh et al., 2021).

Self-collection. Many patients experience embarrassment and discomfort with provider-collection, which are significant barriers to screening (Nagendiram et al., 2021). Most providers and patients view self-collection as an acceptable alternative to provider-collection (Creagh et al., 2021). The sensitivity and specificity of self-collected HPV samples are comparable to provider-collected samples (Biddell et al., 2020; Creagh et al., 2021). Patients who receive a self-collection kit are more likely to undergo cervical cancer screening than those who receive usual care (Winer et al., 2020). Thus, self-collection presents an opportunity to screen individuals who may not otherwise undergo screening (Creagh et al., 2021; Malone, Barnabas, Buist, Tiro, & Winer, 2020).

Guideline Non-adherence

Provider non-adherence to the screening guidelines and knowledge gaps are widespread (Benard et al., 2016; Tatar et al., 2020). An estimated 30%-50% of providers do not follow screening guidelines and over-screening is widespread (Tatar et al., 2020), with an estimated 25%-75% of screening tests being guideline-nonadherent (Benard et al., 2016; Franklin, Webel, Kaelber, Evans, & Kelley, 2020; Hallett & Gerber, 2018; Teoh et al., 2019). By over-screening, patients may be exposed to unnecessary harm, such as cervical biopsies. Further, over-screening unjustly allocates limited resources away from those who need them most.

Provider knowledge gaps. Many providers are unaware that the HPV test is more sensitive and can detect cervical dysplasia earlier than the Pap test (Tatar et al., 2020). Approximately 85% of providers believe liquid-based cytology is the most effective test for reducing cervical cancer mortality, followed by co-testing, followed by conventional cytology

(Tatar et al., 2020). Primary HPV testing is perceived as the least effective test for reducing mortality, after conventional cytology, co-testing, and colposcopy (Tatar et al., 2020). Further, many providers have knowledge gaps on the screening guideline recommendations (Tatar et al., 2020), with 75% suggesting an incorrect screening interval (Benard et al., 2016).

There are common misconceptions that a positive HPV test causes more psychological harm than an abnormal cytology result (Buskwofie et al., 2019) and that increasing screening intervals will lead to patients presenting to primary care less frequently (Dodd, Obermair, & McCaffery, 2020; Slomski, 2020). Neither of these misconceptions is supported by the literature (Buskwofie et al., 2019; Dodd et al., 2020; Slomski, 2020).

Educational interventions. Educational interventions among providers successfully increased guideline-adherent screening (Benard et al., 2016; Recio-Boiles et al., 2020), whereas many other strategies, such as financial incentives for providers, provider mobile phone applications, patient education tools, and clinical decision support alerts within the electronic medical record, have been demonstrated ineffective (Mauro, Rotundo, & Giancotti, 2019; Moscicki et al., 2021; Teoh et al., 2019). One of the key lessons learned from Australia's implementation of its renewed National Cervical Screening Program was that both patients and providers reported that more education would have facilitated a smoother transition (Dodd et al., 2020; Nagendiram et al., 2021; Smith et al., 2019; Sultana et al., 2020).

Educational interventions increased knowledge and guideline adherence for extended periods. Medical staff who participated in an educational intervention about cervical cancer screening guidelines retained increased knowledge two years after the intervention (Recio-Boiles et al., 2020). Providers who participated in an educational intervention focused on the natural history of HPV infection and cervical cancer and the benefits of extended screening intervals

were more likely than control participants to follow guidelines one year after the intervention (Benard et al., 2016). The use of an educational card by providers at a university health center increased guideline-adherent screenings by 34.8% and decreased nonadherent screenings by 26.8%, leading to a potential annual savings of nearly a million dollars (Recio-Boiles et al., 2020).

Barriers to Primary HPV Test Implementation

There are barriers to primary HPV test implementation, such as test and lab availability and lack of provider uptake. Acknowledging these barriers, the ASCCP decided to support, not endorse, the ACS 2020 guidelines (Marcus, Cason, Downs, Einstein, & Flowers, 2021). Other countries, like Australia, have already implemented primary HPV testing, and we can learn from their experience.

Test and lab availability. Currently, there are two HPV tests approved for primary screening: Cobas and Onclarity. However, in 2017, only 41% of laboratories in the US offered primary HPV testing (Slomski, 2020). In Hawai‘i, the two major laboratories, Diagnostic Laboratory Services (DLS) and Clinical Laboratories of Hawai‘i (CLH), both offer primary HPV testing (Clinical Laboratories of Hawai‘i, 2018; Diagnostic Laboratory Services, n.d.; Whelan, A. C., Koyamatsu, T., Kim, W., & Ortega-Lopez, A., 2019).

Provider uptake. Many providers lack knowledge regarding primary HPV testing. Further, many are uncomfortable with the ACS’s recommendation for an increased screening interval and delayed age of screening initiation because they believe this will lead to missed positive screenings and patients will lose contact with the healthcare system (Slomski, 2020). These apprehensions are unfounded. Individuals with a negative HPV test have an extremely low risk (0.14%) of developing CIN 3+ in the next five years (Egemen et al., 2020). Those aged

under 25 have more transient HPV infections and cervical cell changes that clear on their own. By initiating screening later, false positives can be avoided (Slomski, 2020). Australia and several provinces in Canada have increased the age of screening initiation to 25 without experiencing an increase in cervical cancer incidence (Sayed, Naugler, Chen, & Dickinson, 2021; Slomski, 2020).

Colposcopy. When transitioning to an HPV-based screening approach, an initial increase in colposcopy referrals, followed by a decrease, is expected. This trend has been observed in other countries (Dodd et al., 2020; Maver & Poljak, 2020; Ronco & Rossi, 2018; Smith et al., 2019) and is attributed to the HPV test's superior sensitivity (Ronco & Rossi, 2018). This ought to be communicated to U.S. providers to avoid alarm and overwhelming colposcopy providers.

Summary of the Evidence

The superiority of the HPV test was supported by 19 articles ranging from systematic reviews and meta-analyses to expert committee reports. These articles consistently reported that HPV testing, compared to cytology, is more sensitive, detects dysplasia earlier, and will lead to cost savings. Self-collection was discussed in five articles, ranging from a systematic review and meta-analysis to single qualitative studies. These articles consistently reported that many patients, particularly those who do not undergo screening, prefer self-collection and the sensitivity and specificity of self-collected samples are comparable to provider-collected samples. Most of the research on self-collection has been done in Australia and Western Europe, with one study from the US included in the literature review. Thus, the acceptability and accuracy of self-collection in other parts of the world presents a gap in the literature. Four articles consistently described the importance of provider recommendation; however, they were all single descriptive or qualitative studies. Six articles investigated guideline non-adherence,

ranging from a well-designed controlled trial without randomization to single descriptive studies. All of these studies demonstrated widespread over-screening. Lastly, nine articles examined strategies to increase guideline adherence, ranging from systematic review and meta-analysis to expert opinion. The two educational intervention studies both showed increased knowledge and guideline adherence up to two years after participation. A single descriptive study and a single expert opinion article also supported the importance of education. None of the other interventions had an effect. Precisely which educational topics and modalities are most effective in increasing guideline-adherent cervical cancer screening presents another gap in the literature. Future literature searches for educational interventions increasing any type of cancer screening guideline-adherence, not limited to cervical cancer, may be useful.

Methods

Project Design

This DNP project was a quality improvement project aimed at implementing evidence-based practice. The project had two objectives: (1) increase awareness and understanding of cervical cancer screening and management guidelines among providers, MAs, and PSRs and (2) increase patient understanding of pelvic exams, Pap and HPV tests, and HPV's link to cervical cancer. Participants partook in an educational intervention regarding cervical cancer screening and management guidelines. Immediate post-tests and 8-week post-tests were administered. These post-tests assessed knowledge via case-based questions and intended screening recommendations. The key intended outcome was increased knowledge and reported adherence to cervical cancer screening guidelines.

Approval from the University of Hawai‘i, Human Studies Program

This DNP project is an implementation of an evidenced-based healthcare improvement process determined through quality improvement initiatives or program/system evaluation and is deemed not human subjects research. To improve and further develop process improvement and program effectiveness, DNP project activities are related to quality improvement and do not produce generalizable knowledge. Therefore, based on the Common Rule, this project does not require Institutional Review Board (IRB) application or review (University of Hawai‘i Human Studies Program memorandum, 2021) (Appendix B).

Setting

The project setting was WCCH, an FQHC Look-Alike in Wahiawā, Hawai‘i.

Participants

This project used a convenience sample methodology. Inclusion criteria were attendance of the recurring All Provider Monthly Meeting or the recurring Operational Meeting. Providers who do not conduct cervical cancer screening, such as pediatric and behavioral health providers, were excluded from analyses.

Intervention

The intervention development was informed by the Diffusion of Innovations (DOI) Theory. The DOI Theory originated within the field of communication and was created by E.M. Rogers to explain how an idea or product gradually becomes accepted and adopted throughout a population (LaMorte, 2019). The seven roles of the change agent outlined in the DOI Theory were utilized: (1) develop the need for the innovation, (2) establish trust and communication, (3) diagnose perceived problems with the innovation, (4) create the intent to change, (5) put innovation in action, (6) stabilize, and (7) terminate the relationship (Weberg & Davidson,

2021). For role one, the latest screening and management guidelines and the important role of HPV testing were introduced. The importance of health maintenance and disease prevention and the long-term vision of decreasing the incidence of preventable cervical cancer were emphasized. For role two, open communication and discussion were encouraged and trust was developed by outlining the findings of major studies. For role three, anticipated perceived problems with adhering to the changing guidelines, such as fear of missing a positive screening, were identified. Evidence-based responses and/or solutions to these perceived problems were provided. For role four, the intent to offer appropriate cervical cancer screening was created by empowering clinic providers and support staff with knowledge through the educational intervention. Role five was measured by the 8-week post-test. For role six, true long-term stabilization was not measured due to time constraints of the DNP project. However, a proxy for stabilization was measured by the 8-week post-test. For role seven, the DNP project committee will dismantle after the project presentation.

Each of the five adopter categories was considered when creating the educational intervention. Some people are attracted to the latest and greatest (i.e., Innovators and Early Adopters), while others are wary of change (i.e., Laggards). However, the bulk of the population would be considered Early Majority and Late Majority. Each of the adopter categories tends to have a pattern of similar characteristics, values, attitudes, and beliefs (LaMorte, 2019). The Innovators group is risk-taking and enjoys being on the cutting edge. They need little persuasion to adopt the latest guidelines. The Early Adopters group is also eager to adopt the latest guidelines. They most benefit from assistance on how to implement the adoption, such as manuals and information sheets (LaMorte, 2019). The educational presentation included information on how to make the practice change (e.g., how to order the primary HPV test at DLS

and how to navigate the ASCCP management website). The educational intervention focused most heavily on the Early Majority and Late Majority groups. To target the Early Majority group, the evidence that led to the guideline changes was discussed, demonstrating that the new approach to cervical cancer screening leads to fewer unnecessary screenings and biopsies, allowing resources to be focused on those most at risk. To address the Late Majority group, information was provided on how other countries around the globe have already made the same or similar changes to their guidelines, such as most European countries, Australia, and Canada (Slomski, 2020). Some countries, such as the Netherlands, are increasing the age of cervical cancer screening initiation to 30 (Slomski, 2020). The Laggard group was anticipated to be the most difficult to persuade. They tend to be traditional, conservative, and skeptical of change (LaMorte, 2019). The evidence that led to the guideline changes and that over-screening can lead to harm, such as unnecessary biopsies which can leave scarring on the cervix, was emphasized.

Educational presentations. The educational presentation with providers occurred during the August 10, 2022 instance of the recurring All Provider Monthly Meeting. The educational presentation with providers consisted of (1) background on cervical cancer; (2) an overview of the various screening guidelines, how they align with quality measures, the evidence that led to the changing guidelines, how to check screening status and correctly document screenings within the electronic health record (EHR), lab availability and insurance coverage of the screening tests; and (3) the ASCCP 2019 risk-based management guidelines, the evidence that led to the updated guidelines, and a demonstration of the ASCCP web-based application (Supplemental Material 1). The educational presentation with support staff occurred during the September 14, 2022 instance of the recurring Operational Meeting. Support staff received a modified version of the educational presentation (Supplemental Material 2).

Cheat sheet. A simple, point-of-care reference sheet was developed. This "cheat sheet" can be referenced when unsure of screening test parameters (Appendix C).

Patient education handout. An educational handout was created for distribution among patients. The handout was written at the fifth-grade reading level and covered the differences and similarities between pelvic exams, Pap tests, and HPV tests (Appendix D).

ASCCP management web-based application. The ASCCP web-based application was demonstrated. Providers, MAs, and PSRs were encouraged to add shortcuts to the web-based application to their work computers. The URL was provided multiple times in several formats, such as the full URL, a tiny URL, and a QR code.

Data Collection

Participants in the educational interventions completed immediate post-tests and 8-week post-tests. Each aspect of the project's multi-pronged approach (i.e., educational presentation, "cheat sheet," patient education handout, and ASCCP management website shortcut) was assessed. The provider immediate post-test focused on behavioral intentions and case-based knowledge (Appendix E). The provider 8-week post-test assessed behaviors over the past month (Appendix F). The support staff immediate post-test assessed content knowledge (Appendix G) and the 8-week follow-up post-test assessed knowledge retention (Appendix H).

Data Analysis

Data analysis of the post-tests was conducted in Microsoft Excel. Quantitative variables were summarized with descriptive statistics. In addition to analyzing variables individually, changes from the immediate post-test to the 8-week post-test were evaluated. Qualitative variables were examined and exemplar quotes were provided. Due to small sample size, no subgroup quantitative analyses or qualitative thematic coding were done.

Results

Participant Characteristics

Participants of the educational presentations (n = 28) consisted of a convenience sample of primary care providers (i.e., advanced practice registered nurses [APRNs] and physicians), behavioral health providers, MAs, and PSRs (Table 4). Five primary care providers participated: three were from the Family Medicine department and two were from the Pediatrics department. Three behavioral health providers participated. Twenty support staff participated, consisting of 11 MAs and nine PSRs.

Table 4

Educational presentation participants

	n = 28
Family medicine	3
Physician	2
APRN	1
Pediatrics	2
Physician	1
APRN	1
Behavioral health	3
MAs	11
PSRs	9

Provider-specific Results

Of the family medicine primary care providers who participated in the educational presentation (n = 3), two providers completed the immediate post-test (response rate = 66.7%) (Table 5). Of those who completed the immediate post-test, 50% identified as male and 50% identified as female. Type of provider included 50% physician (i.e., MD/DO) and 50% APRN. Fifty percent indicated they perform, on average, one to 10 cervical cancer screenings per month. The other 50% stated they perform an average of 11-20 cervical cancer screenings per month.

Half of the providers stated they do not refer any patients for cervical cancer screening while the other half reported referring an average of one to 10 patients per month. All providers indicated they initiate cervical cancer screening at age 21, screen average-risk patients aged 30 to 65 years with a co-test every 5 years, and follow the 2019 ASCCP guidelines to manage abnormal screening results. This translates to 100% accuracy in intent to offer an appropriate cervical cancer screening method to the right patients at the right time.

From the immediate post-test to the 8-week post-test, there was a shift from performing cervical cancer screenings to referring. While the providers initially indicated that they, on average, perform up to 20 cervical cancer screenings per month, they reported performing no screenings in the past month. The reported number of cervical cancer screening referrals increased. Initially, the providers indicated an average of zero to 10 referrals per month. At the 8-week post-test, 50% reported one to 10 referrals in the past month and 50% reported over 20 referrals. In addition, there was a change to recommending screening at shorter intervals. At the immediate post-test, all providers stated they recommend co-testing every five years for average-risk patients aged 30 to 65 years. At the 8-week post-test, half of the providers stated they had been recommending co-testing every three years for average-risk patients aged 30 to 65 years, while the other half recommended five-year intervals. In other words, eight weeks post-intervention, the providers maintained 100% accuracy in offering an appropriate screening test. However, accuracy for the correct testing interval decreased from 100% to 50%.

Table 5

Descriptive statistics of the immediate and 8-week provider post-test results

	Immediate post-test *n* (%)	8-week post-test *n* (%)
Age (in years)		
< 49	2 (100)	2 (100)
Gender		
Male	1 (50)	1 (50)
Female	1 (50)	1 (50)
Medical training		
MD/DO	1 (50)	1 (50)
APRN	1 (50)	1 (50)
CCSs performed per month/over the past month		
None	0 (0)	2 (100)
1-10	1 (50)	0 (0)
11-20	1 (50)	0 (0)
CCS referrals per month/over the past month		
None	1 (50)	0 (0)
1-10	1 (50)	1 (50)
11-20	0 (0)	0 (0)
> 20	0 (0)	1 (50)
Age of screening initiation		
Age 21	2 (100)	2 (100)
Screening method for average-risk patients aged 30 to 65		
Co-testing	2 (100)	2 (100)
Screening interval for average-risk patients aged 30 to 65		
Every 3 years	0 (0)	1 (50)
Every 5 years	2 (100)	1 (50)
Management of abnormal screening results		
2019 ASCCP Guidelines	2 (100)	2 (100)

Note. CCS = Cervical cancer screening

At the immediate post-test, the providers indicated they were likely or very likely to incorporate the content learned from the educational presentation and use of the ASCCP mobile

application into their practice (Table 6). The reported likelihood of incorporating the other materials (i.e., patient education handout, “cheat sheet,” shortcut to the ASCCP web-based application, and ASCCP web-based application) was inconsistent, with 50% of providers stating they were unlikely to incorporate these materials. The other 50% indicated they were likely to incorporate the patient education handout, “cheat sheet,” and shortcut to the ASCCP web-based application and were very likely to incorporate the ASCCP web-based application.

Table 6

Provider likelihood of incorporating materials into practice

	Very unlikely *n* (%)	Unlikely *n* (%)	Likely *n* (%)	Very likely *n* (%)
Content from educational presentation	0 (0)	0 (0)	1 (50)	1 (50)
Patient education handout	0 (0)	1 (50)	1 (50)	0 (0)
"Cheat sheet"	0 (0)	1 (50)	1 (50)	0 (0)
Shortcut to ASCCP web-based application	0 (0)	1 (50)	1 (50)	0 (0)
ASCCP web-based application	0 (0)	1 (50)	0 (0)	1 (50)
ASCCP mobile app	0 (0)	0 (0)	1 (50)	1 (50)

At the 8-week post-test, all providers stated the following were very useful: content learned from the educational presentation, patient education handout, “cheat sheet,” shortcut to the ASCCP web-based application, and ASCCP web-based application (Table 7). One provider stated that the patient education handout is “informative and gives patients something to read and learn from.” One provider said the cheat sheet “helps to remind me intervals and tests needed,” while another provider said, “love any cheat sheet to help patients.” One provider reported that the desktop shortcut to the ASCCP web-based application has improved the management of abnormal results by providing “helpful guidance for f/u [follow-up].” Half of the providers have not yet used the ASCCP mobile app, while the other half reported it was very useful.

Table 7

Usefulness of materials

	Haven't used *n* (%)	Not useful *n* (%)	Somewhat useful *n* (%)	Very useful *n* (%)
Content from educational presentation	0 (0)	0 (0)	0 (0)	2 (100)
Patient education handout	0 (0)	0 (0)	0 (0)	2 (100)
"Cheat sheet"	0 (0)	0 (0)	0 (0)	2 (100)
Shortcut to ASCCP web-based application	0 (0)	0 (0)	0 (0)	2 (100)
ASCCP web-based application	0 (0)	0 (0)	0 (0)	2 (100)
ASCCP mobile app	1 (50)	0 (0)	0 (0)	1 (50)

No providers correctly answered the question assessing which patients should exit from routine screening (Table 8). Only one provider correctly answered one of the two questions assessing management of abnormal results (Table 9). The providers indicated they prefer to learn of new screening and management guidelines from in-house lectures/panel discussions, publications, and at national professional meetings (Table 10).

Table 8

Patients over age 65 to exit from routine cervical cancer screening

	Frequency (n = 2)
A person older than 65, regardless of history	1
*A person with a history of hysterectomy with no residual cervix for non-cancerous indication and no history of CIN 2+	1
*A person with no history of CIN 2+ and normal/negative routine screening during the past 10 years	0
A person who had CIN 2+ 10 years ago and normal/negative follow-up testing ever since	0
*A person who had CIN 2+ 25 years ago and normal/negative follow-up testing ever since	0
A person with a history of immunosuppression (e.g., HIV, organ transplantation, exposure to DES)	0

Note. *Correct answers

Table 9

Management of abnormal results

	Frequency (n = 2)
36-year-old patient with history of co-test NILM/HPV negative in 2017. This year, in 2022, her screening test results are ASC-US/HPV positive, type unknown.	
*1-year follow-up with HPV test or co-test	0
Colposcopy	2
65-year-old patient with history of CIN 3 treated with LEEP at age 50 (positive for HPV at that time). Close follow-up with normal/negative screening since, including her most recent co-test at age 64.	
Exit from screening based on age	1
*Continuation of screening until at least age 75	1

Note. *Correct answers

Table 10

Preferred method of education on new screening and management guidelines

	Frequency (n = 2)
Lecture/panel discussion (in house)	1
Publications	1
National professional meetings	1
State/regional professional meetings	0
Local professional meetings	0
Webinar/online CME	0

MA/PSR-specific Results

Of the support staff (i.e., MAs and PSRs) who participated in the educational presentation (n = 20), seven completed the immediate post-test and nine completed the 8-week post-test (response rate was 35% and 45%, respectively) (Table 11). Of those who completed the post-tests, 100% identified as female. The immediate post-test sample consisted of a mix of MAs

(14%), PSRs (43%), and those who selected "other" or left the question blank (43%). At the 8-week post-test, all respondents were MAs. The percentage of support staff selecting the USPSTF-recommended age of screening initiation (i.e., age 21) increased from 71% at the immediate post-test to 78% at the 8-week post-test. The remainder of the knowledge questions exhibited some knowledge decline from the immediate post-test to the 8-week post-test. For instance, at the immediate post-test, 71% of support staff correctly stated that Pap testing, HPV testing, and co-testing are all acceptable screening methods for average-risk patients aged 30 to 65 years. At the 8-week post-test, all support staff incorrectly selected only co-testing as an acceptable method. In addition, the percentage of support staff correctly identifying the screening interval for Pap testing and HPV/co-testing for average-risk patients aged 30 to 65 years was 71% and 100%, respectively, at immediate post-test. At the 8-week post-test, the rate decreased to 56% and 67%, respectively.

Table 11

Descriptive statistics of the immediate and 8-week MA/PSR results

	Immediate post-test *n* (%)	8-week post-test *n* (%)
Age (in years)		
20-39	6 (86)	7 (78)
40-59	1 (14)	2 (22)
Gender		
Female	7 (100)	9 (100)
Medical training		
MA	1 (14)	9 (100)
PSR	3 (43)	0 (0)
Other/blank	3 (43)	0 (0)
Age of screening initiation		
Age 21*	5 (71)	7 (78)
Age 25	1 (14)	0 (0)
First sexual activity	1 (14)	2 (22)

Acceptable screening method/s		
Pap, HPV, or co-testing*	5 (71)	0 (0)
Co-testing	2 (29)	9 (100)
Pap test interval		
Annually	0 (0)	1 (11)
Every 3 years*	5 (71)	5 (56)
Every 5 years	2 (29)	3 (33)
HPV or co-test interval		
Annually	0 (0)	1 (11)
Every 3 years	0 (0)	2 (22)
Every 5 years*	7 (100)	6 (67)
ASCCP 2019 based on:		
Algorithms	4 (57)	2 (22)
Current results*	5 (71)	3 (33)
Past results*	6 (86)	3 (33)
Immediate CIN3+ risk*	3 (43)	3 (33)
5-year CIN3+ risk*	2 (29)	5 (56)
ASCCP 2019 access		
Web app*	7 (100)	6 (67)
Mobile app*	4 (57)	3 (33)
Athena	2 (29)	5 (56)

Note. *Correct answers

At the immediate post-test, nearly all support staff indicated they were likely or very likely to incorporate all of the materials into their practice (Table 12). At the 8-week post-test, all support staff who had used the materials found them somewhat or very helpful (Table 13). One support staff member stated that the patient education handout is “a very helpful tool to keep our patients informed on . . . why it’s important to get cervical cancer screening done.” One support staff member said the cheat sheet helps them “not to forget anything.” One support staff member reported that the desktop shortcut to the ASCCP web-based application saves time.

Table 12

Support staff likelihood of incorporating materials into practice

	Very unlikely *n* (%)	Unlikely *n* (%)	Likely *n* (%)	Very likely *n* (%)
Content from educational presentation	0 (0)	0 (0)	3 (43)	4 (57)
Patient education handout	0 (0)	1 (14)	3 (43)	3 (43)
"Cheat sheet"	0 (0)	0 (0)	3 (43)	4 (57)
Shortcut to ASCCP web-based application	0 (0)	0 (0)	3 (43)	4 (57)
ASCCP web-based application	0 (0)	0 (0)	3 (43)	4 (57)
ASCCP mobile app	0 (0)	0 (0)	4 (57)	2 (29)

Table 13

Usefulness of materials

	Haven't used *n* (%)	Not useful *n* (%)	Somewhat useful *n* (%)	Very useful *n* (%)
Content from educational presentation	0 (0)	0 (0)	2 (22)	7 (78)
Patient education handout	0 (0)	0 (0)	1 (11)	8 (89)
"Cheat sheet"	2 (22)	0 (0)	1 (11)	6 (67)
Shortcut to ASCCP web-based application	1 (11)	0 (0)	1 (11)	7 (78)
ASCCP web-based application	0 (0)	0 (0)	1 (11)	8 (89)
ASCCP mobile app	2 (22)	0 (0)	1 (11)	6 (67)

Similar to the providers, no support staff selected all of the correct answer options to the question assessing which patients should exit from routine screening (Table 14). Support staff indicated they prefer to learn of new screening and management guidelines from webinars/online CME, in-house lecture/panel discussions, and publications. (Table 15). The latter two are also preferred by providers. While some of the providers expressed interest in national professional meetings, support staff prefer local professional meetings.

Table 14

Patients over age 65 to exit from routine cervical cancer screening

	Frequency (n = 7)
A person older than 65, regardless of history	2
*A person with a history of hysterectomy with no residual cervix for non-cancerous indication and no history of CIN 2+	6
*A person with no history of CIN 2+ and normal/negative routine screening during the past 10 years	2
A person who had CIN 2+ 10 years ago and normal/negative follow-up testing ever since	0
*A person who had CIN 2+ 25 years ago and normal/negative follow-up testing ever since	0
A person with a history of immunosuppression (e.g., HIV, organ transplantation, exposure to DES)	0

Note. *Correct answers

Table 15

Preferred method of education on new screening and management guidelines

	Frequency (n = 7)
Webinar/online CME	6
Lecture/panel discussion (in house)	4
Publications	3
Local professional meetings	1
National professional meetings	0
State/regional professional meetings	0

Discussion

The purpose of this quality improvement project was to decrease the incidence of cervical cancer among WCCH patients. To achieve this, the project had two objectives: (1) increase awareness and understanding of cervical cancer screening and management guidelines among providers, MAs, and PSRs, and (2) increase patient understanding of pelvic exams, Pap and HPV tests, and HPV's link to cervical cancer. The literature review highlighted widespread provider non-adherence to cervical cancer screening guidelines and knowledge gaps (Benard et al., 2016; Tatar et al., 2020). The literature supported that educational interventions among healthcare professionals increase knowledge and guideline adherence for up to two years after participation (Benard et al., 2016; Recio-Boiles et al., 2020), whereas many other strategies have been demonstrated ineffective (Mauro et al., 2019; Moscicki et al., 2021; Teoh et al., 2019). The needs assessment validated the need for education to address knowledge gaps among the providers, MAs, PSRs, and patients. The findings of this project supported the use of a multi-pronged approach (i.e., educational presentations, "cheat sheet," patient education handout, and ASCCP management website shortcut) in addressing these gaps.

After participation in the educational intervention, the providers demonstrated 100% accuracy regarding intent to offer an appropriate cervical cancer screening method to appropriate patients at the correct time interval. This finding aligns with prior research, which has also found that educational interventions among providers led to high rates of guideline-adherent cervical cancer screening (Benard et al., 2016; Recio-Boiles et al., 2020). Knowledge retention was high from the immediate post-test to the 8-week post-test among both the provider group and, to a lesser extent, among the MA/PSR group. This is similar to prior research findings that educational interventions among providers led to long-term (up to two years) improvements in

cervical cancer screening (Benard et al., 2016; Recio-Boiles et al., 2020). However, both the provider group and the MA/PSR group did demonstrate a degree of knowledge loss regarding screening intervals. At the immediate post-tests, both groups demonstrated 100% accuracy regarding co-testing interval. At the 8-week post-tests, only 50% of providers and 67% of support staff selected the correct co-test interval, with the remaining respondents selecting an interval that is too short. Past studies have also found that it is common for cervical cancer screening tests to be done at intervals that are shorter than the guideline recommendations (i.e., over-screening) (Franklin et al., 2020; Tatar et al., 2020). To improve retention of screening interval knowledge, providers and support staff may benefit from intermittent refresher training and review of the "cheat sheet."

Both the provider group and the MA/PSR group demonstrated difficulty identifying appropriate patients to exit from routine screening. This is not surprising, as exiting criteria were not a strong focus of the presentation. In addition, the providers also had room for improvement on the questions assessing the management of abnormal screening results. These findings highlight exiting criteria and use of the ASCCP management application as potential directions for future training.

Providers, MAs, and PSRs indicated they prefer to learn of new screening and management guidelines from in-house lectures/panel discussions and publications. When making decisions regarding training, these formats should be considered.

Effects on patient knowledge were indirectly assessed through the provider and support staff post-tests. All providers and support staff endorsed the usefulness of the patient education handout. The patient education handout was regarded as "informative and gives patients

something to read and learn from" and "a very helpful tool to keep our patients informed . . . why it's important to get cervical cancer screening done."

Strengths and Limitations

The implications of this study should be interpreted in light of its strengths and limitations. The intervention consisted of a multi-pronged approach (i.e., educational presentations, "cheat sheet," patient education handout, and ASCCP management website shortcut) targeting multiple content areas (e.g., screening and management) and participant groups (i.e., providers, MAs, PSRs, and patients). Participation in the educational presentations was far-reaching, including all attendees of the August 10, 2022 instance of the recurring All Provider Monthly Meeting and the September 14, 2022 instance of the recurring Operational Meeting. The intervention enjoyed strong support from WCCH's leadership team, particularly in light of their upcoming Health Resources and Services Administration (HRSA) site visit. The materials created for this project would require minimal modification for use with other clinics.

Participants consisted of a convenience sample and post-test response rates ranged from 35% to 67%. Thus, these data may not accurately represent the providers, MAs, and PSRs at WCCH. In addition, patient understanding was not directly assessed. Due to time constraint, only the project's short-term (2 month) goal was assessed. Further evaluation is needed to assess the project's medium-term (3-7 year) and long-term (>7 year) goals of decreased colposcopy rate and decreased incidence of preventable cervical cancer, respectively.

Future Directions

Future training should consist of in-house lectures/panel discussions, including topics such as refreshers on cervical cancer screening test intervals, routine screening exiting criteria, and management of abnormal screening results. The materials created for this project may be

considered for distribution among all newly hired employees in the Family Medicine and Women's Health departments. In addition, leadership may consider placing a "cheat sheet" at every computer workstation and a desktop shortcut to the ASCCP management website on every computer. The patient education handout may be translated into other languages and placed in the patient examination rooms.

Conclusion

The objectives of this quality improvement project were to (1) increase awareness and understanding of cervical cancer screening and management guidelines among providers, MAs, and PSRs and (2) increase patient understanding of pelvic exams, Pap and HPV tests, and HPV's link to cervical cancer. The purpose and long-term goal of the project were to decrease the incidence of preventable cervical cancer among WCCH patients. Utilizing a multi-pronged intervention, the project's objectives were met. Future interventions should include in-house lectures/panel discussions on cervical cancer screening test intervals, routine screening exiting criteria, and management of abnormal screening results; distribution of educational materials to newly hired Family Medicine and Women's Health providers and support staff; and translation and placement of the patient education handout in the examination rooms. As the rate of guideline-adherent cervical cancer screening increases, it is anticipated that the incidence of preventable cervical cancer will decrease. Additionally, by following appropriate screening intervals, resources can be focused on patients who are at higher risk. Due to the long natural history of cervical cancer, long-term surveillance of clinic data is needed to assess the achievement of the project's purpose and long-term goal of decreasing the incidence of preventable cervical cancer among WCCH patients.

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Appendix A

Stakeholder Interview Script

Primary Care Providers, Nurses, MAs

CCS

- What are the current practices and philosophies around CCS?
- What screening guidelines are you using?
- What is the screening protocol for the average-risk person?
    - Which test?
    - How often?
    - Age of initiation?
    - Age of exit?
- What do you think are the biggest barriers to screening?
- How has covid affected CCS and follow-up?

CCS follow-up tracking:

- Do you have a follow-up tracking system?
- Who does follow-up tracking?
- What is the process?
- What parts of this process go well?
- What parts of this process don't go well?

Abnormal CCS management:

- What is the protocol for referral of abnormal results?
- What guidelines do you use for management of abnormal results?
    - Are you using the 2019 ASCCP guidelines for management?
    - Are you using the app or website?
- Who does WCCH's colposcopies?

HPV vaccination:

- What are the current practices and philosophies around HPV vaccination?
- What is the protocol for HPV vaccine recommendation?
- At what age are you routinely recommending this vaccine?
- How do you handle older adolescents up to age 26?
    - How do you catch them up?
- What's the practice/philosophy regarding HPV vaccination for pts aged 26-45?
- What do you think are the biggest barriers to HPV vaccination?
    - Probe: different barriers for different age ranges?

Closing:

- What type of in-service would be beneficial regarding CCS?
    - Formalized screening protocol, tracking system, in-service 2019 management guidelines and phone app, in-service latest thinking around screening, post covid catch up protocol
- Any other thoughts you would like to share?

Leadership

- Do you believe providers, nurses, MAs are knowledgeable on this topic?
- What do you think are the biggest barriers to screening?
- What type of in-service would be beneficial regarding CCS?

WH Providers

- Do you get the pt when you want to?
- Is there anything you wish the primary care providers knew?
- Do you have any ideas for a better way to facilitate communication between WH and primary care?

Appendix B

Office of Research Compliance
Human Studies Program

UNIVERSITY of HAWAI'I SYSTEM

August 6, 2021

MEMORANDUM

TO: Rick Ramirez, DNP, APRN-Rx, AG-ACNP-BC, FNP-BC, ENP-C, CEN, CPEN
Doctor of Nursing Practice Program Director and Assistant Professor
AG-PCNP Specialty Coordinator
APRN Clinical Course Series Faculty Coordinator
University of Hawai'i at Mānoa
School of Nursing and Dental Hygiene

FROM: Victoria Rivera
Director, Office of Research Compliance, Human Studies Program
University of Hawaii

SUBJECT: Doctor of Nursing Practice Program

This memorandum intends to clarify the University of Hawaii (UH), Human Studies Program (HSP) position regarding the quality improvement (QI) project required by the UH School of Nursing and Dental Hygiene's Doctor of Nursing (DNP) Program.

Based on our discussions, students enrolled in the DNP Program are required to complete a QI project in order to meet the *AACN Essentials of Doctoral Education for Advanced Nursing Practice* for this professional degree. According to the AACN guidelines, since this is a practice doctorate, "requiring a dissertation or other original research is contrary to the intent of the DNP. The DNP primarily involves mastery of an advanced speciality within nursing practice."

Therefore, by definition, the DNP quality improvement project required by the UH School of Nursing is not considered human subjects research as defined under federal regulations at 45 CFR 46. To very briefly summarize, *research* is a systematic investigation designed to contribute to generalizable knowledge, and *human subject* means a living individual about whom an investigator conducting research obtains 1) data through intervention or interaction with the individual or 2) identifiable private information. Quality improvement/program evaluation focuses on making judgements about the program, to improve or further develop program effectiveness, and inform decisions about future programming. As part of the DNP program, students are familiarized with the difference between conducting a QI project and a research project.

Given the purpose of the DNP quality improvement project, it is the position of the UH Human Studies Program that these projects are considered "NOT human subjects research" (NHSR) and as such, does not require IRB review. To be clear, this is not a determination of "Exempt" status under 46.101, as these are categories of *research* considered to be exempt from IRB review. Please ensure that DNP students understand that the results of these types of QI projects may be presented or published, but must not be labled as human subjects research.

Please feel free to contact our office for any questions.

cc: Alice Tse, SODNH Department Chair and Graduate Chair

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Appendix C

"Cheat Sheet"

HPV Vaccination

- ≤ 26 recommended
- 27-45 shared decision-making

Cervical Cancer Screening for Average-Risk Individuals

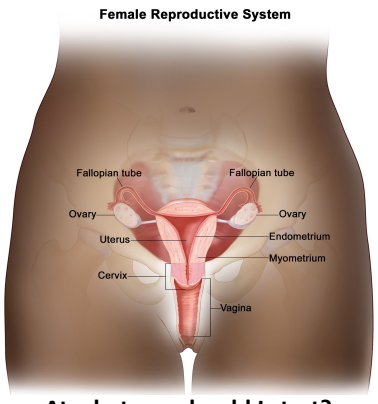
Age	USPSTF (2018)	ACS (2020)
≤ 20	No screening	No screening
21-24	Pap test every 3 years	No screening
25-29	Pap test every 3 years	HPV test every 5 years (preferred) OR HPV/Pap co-test every 5 years OR Pap test every 3 years
30-65	HPV test every 5 years OR HPV/Pap co-test every 5 years OR Pap test every 3 years	HPV test every 5 years (preferred) OR HPV/Pap co-test every 5 years OR Pap test every 3 years
≥66	No screening	No screening
Hysterectomy with no residual cervix and no history of CIN 2+	No screening	No screening

Management

https://app.asccp.org/

Appendix D

Patient Education Handout

Pelvic Exam	Pap Test	HPV Test
	What is it?	
Your doctor or nurse will look at the outside and inside of your genitals to check for things like cysts, abnormal discharge, warts, infection, and tumors.	A test looking for changes to the cells of your cervix. These changes can be a sign of inflammation, irritation, pre-cancer, or cancer.	A test looking for the DNA of the virus that is the cause of cervical cancer. This virus is called human papillomavirus, or HPV for short.
	What happens?	
Usually, there are 3 parts: (1) your doctor or nurse will look at the outside of your genitals (called the vulva). (2) your doctor or nurse will look at your vagina and cervix using a tool called a speculum. (3) your doctor or nurse will check your uterus and ovaries by putting 1 or 2 gloved fingers in your vagina while gently pressing on your lower stomach with the other hand.	During a speculum exam (part 2 of the pelvic exam), your doctor or nurse will use a soft brush to collect cells for testing.  	During a speculum exam (part 2 of the pelvic exam), your doctor or nurse will use a soft swab or brush to collect cells for testing. This is often done at the same time as the Pap test, but could also be done alone.
	At what age should I start?	
21	21	25 or 30
	How often?	
You and your doctor or nurse will decide together how often you should have a pelvic exam. You may need to have pelvic exams more often if you have symptoms or a history of reproductive health problems.	Every 3 years if your Pap test is normal. If your Pap test is abnormal, you will be monitored more closely with further testing like HPV testing and/or colposcopy.	Every 5 years if your HPV test is negative (normal). If your HPV test is positive (abnormal), you will be monitored more closely with further testing like Pap testing and/or colposcopy.
	At what age should I stop?	
You and your doctor or nurse will decide together when to stop having pelvic exams.	66, as long as your Pap and HPV tests have been normal/negative for many years.	66, as long as your HPV tests have been negative (normal) for many years.

Appendix E

Provider Immediate Post-test

Cervical Cancer Screening and Management Questionnaire

Thank you for participating in the educational presentation and for completing this questionnaire.

First, please answer a few questions about how you **PLAN to screen moving forward** (not necessarily what you have been doing).

1. At what age do you plan to start routine cervical cancer screening?

   Mark only one oval.

   - ◯ When the person first initiates sexual activity
   - ◯ Age 21
   - ◯ Age 25

Please note: Screening recommendations for ages 21-29 are rapidly evolving. For the following questions, please answer with respect to **average-risk patients ages 30 to 65**.

2. For average-risk patients **ages 30 to 65**, what do you plan to use for screening?

   Mark only one oval.

   - ◯ Pap test alone (cervical cytology)
   - ◯ Pap test plus HPV testing (co-testing)
   - ◯ HPV testing alone (primary HPV testing)

3. **If you checked "Pap test alone,"** please indicate why you are planning to screen with Pap test alone instead of co-test or primary HPV test.

   Check all that apply.

   - ☐ Our patients prefer Pap testing alone
   - ☐ Our clinicians prefer Pap testing alone
   - ☐ Primary HPV testing is too expensive
   - ☐ Co-testing is too expensive
   - ☐ Primary HPV testing is not available
   - ☐ Co-testing is not available
   - ☐ Managing HPV test results is too confusing
   - ☐ Counseling patients with positive HPV test results is too time consuming
   - ☐ Other: _____

4. Based on your response to the previous question, for average-risk patients **ages 30 to 65**, with a history of **normal/negative screening results**, how often do you plan to recommend cervical cancer screening?

   Check all that apply.

   - ☐ Annually
   - ☐ Every 3 years
   - ☐ Every 5 years
   - ☐ Other: _____

Exiting Screening

For the following question, please think about patients **over age 65**.

5. Which of the following patients (all **over age 65**) would you **exit** from routine cervical cancer screening?

Check all that apply.

- [ ] A person older than 65, regardless of history
- [ ] A person with a history of hysterectomy with no residual cervix for non-cancerous indication and no history of CIN 2+
- [ ] A person with no history of CIN 2+ and normal/negative routine screening during the past 10 years
- [ ] A person who had CIN 2+ 10 years ago and normal/negative follow-up testing ever since
- [ ] A person who had CIN 2+ 25 years ago and normal/negative follow-up testing ever since
- [ ] A person with a history of immunosuppression (e.g., HIV, organ transplantation, exposure to DES)

Patient Scenarios

The next few questions present patient scenarios and ask how you would manage a patient with these results. **You may use any resources** you typically reference when managing patients with abnormal cervical cancer screening results (e.g., ASCCP app or website, or other).

6. **SCENARIO A**: A 36-year-old patient has always had normal/negative cervical cancer screening test results, including a co-test result of normal Pap test (NILM)/HPV negative in 2017. This year, in 2022, her screening test results are ASC-US/HPV positive, type unknown. You recommend:

Mark only one oval.

- ◯ Treatment (e.g., LEEP)
- ◯ Colposcopy
- ◯ 1-year follow-up with an HPV test alone
- ◯ 1-year follow-up with a co-test
- ◯ 1-year follow-up with a Pap test alone (cervical cytology)
- ◯ 3-year follow-up with an HPV test alone
- ◯ 3-year follow-up with a co-test
- ◯ 3-year follow-up with a Pap test alone (cervical cytology)
- ◯ 5-year follow-up with an HPV test alone
- ◯ 5-year follow-up with a co-test
- ◯ Other: _____

7. **SCENARIO B**: A 65-year-old patient comes in for an annual physical exam. She reports a history of CIN 3 treated with LEEP at age 50 (positive for HPV at that time). She has had close follow-up with normal/negative screening since, including her most recent co-test at age 64. You recommend:

Mark only one oval.

- ◯ Exit from screening based on age
- ◯ Continuation of screening until at least age 70
- ◯ Continuation of screening until at least age 75
- ◯ Other: _____

8. How did you determine your management plans for the patients in Scenarios A-B?

Mark only one oval.

- ◯ 2019 ASCCP Risk-Based Management Consensus Guidelines
- ◯ 2012 ASCCP Consensus Guidelines (algorithms)
- ◯ Guideline from my own institution or healthcare system
- ◯ Other: _____

9. If you are not following the 2019 ASCCP Risk-Based Management Consensus Guidelines, please tell us why.

Check all that apply.

- ☐ N/A - I am following the 2019 ASCCP Risk-Based Management Consensus Guidelines
- ☐ I didn't realize there were new guidelines/I don't know what the updated guidelines recommend
- ☐ I know about the guidelines but find them hard to implement in clinical practice
- ☐ I cannot access the website or app with the 2019 guidelines in my clinic/practice setting
- ☐ I follow the 2012 ASCCP guidelines
- ☐ I follow my institution or healthcare system guidelines
- ☐ I don't believe the guidelines apply to my patients

10. If you answered "I don't believe the guidelines apply to my patients," please tell us why.

_____

11. How likely are you to incorporate the following into your practice?

Mark only one oval per row.

	Very unlikely	Unlikely	Likely	Very likely
Content learned from educational presentation by Brettany Clemens	◯	◯	◯	◯
Patient education pamphlet	◯	◯	◯	◯
"Cheat sheet"	◯	◯	◯	◯
Shortcut to ASCCP web-based application	◯	◯	◯	◯
ASCCP web-based application	◯	◯	◯	◯
ASCCP mobile app	◯	◯	◯	◯

12. Moving forward, how would you prefer to learn about new screening and management guidelines?

Check all that apply.

- [ ] Lecture/panel discussion (in house)
- [ ] Webinar/online CME (e.g., Medscape, WebMD)
- [ ] Publications
- [ ] Local professional meetings
- [ ] State/regional professional meetings
- [ ] National professional meetings

Demographics

In this last section, we'll ask a few demographic questions.

13. What is your age?

Mark only one oval.

- ◯ < 40
- ◯ 40-49
- ◯ 50-59
- ◯ 60+

14. What is your current gender identity?

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Other: _____

15. Which of the following best describes your highest level of medical training?

Mark only one oval.

- ◯ MD/DO
- ◯ PA
- ◯ APRN
- ◯ RN
- ◯ MA
- ◯ Other: _____

16. On average, on how many patients per month do you **perform** cervical cancer screening? This can either be with Pap tests alone (cervical cytology), HPV tests alone, and/or co-tests.

Mark only one oval.

- ◯ None
- ◯ 1-10
- ◯ 11-20
- ◯ >20

17. On average, how many patients per month do you **refer** for cervical cancer screening?

Mark only one oval.

- ◯ None
- ◯ 1-10
- ◯ 11-20
- ◯ >20

Appendix F

Provider 8-week Post-test

Cervical Cancer Screening and Management Questionnaire #2

Thank you for taking the time to complete this questionnaire. It helps us understand the impact, if any, of the educational presentation and materials on your practice.

This questionnaire is **anonymous**. No identifiable information, such as IP addresses, will be collected.

First, we'll ask a few questions about how you have been screening **average-risk patients** for cervical cancer. Please think back on how you have managed patients over the past month.

1. Over the past month, on approximately how many patients did you **perform** cervical cancer screening? This can either be with Pap tests alone (cervical cytology), HPV tests alone, and/or co-tests.

   Mark only one oval.

   - ◯ None
   - ◯ 1-10
   - ◯ 11-20
   - ◯ >20

2. Over the past month, approximately how many patients did you **refer** for cervical cancer screening?

   Mark only one oval.

   - ◯ None
   - ◯ 1-10
   - ◯ 11-20
   - ◯ >20

3. At what age have you been starting routine cervical cancer screening?

   Mark only one oval.

   - ◯ When the person first initiates sexual activity
   - ◯ Age 21
   - ◯ Age 25

Please note: Screening recommendations for ages 21-29 are rapidly evolving. For the following questions, please answer with respect to **average-risk patients ages 30 to 65**.

4. For average-risk patients **ages 30 to 65**, what have you been using for screening?

   Mark only one oval.

   - ◯ Pap test alone (cervical cytology)
   - ◯ Pap test plus HPV testing (co-testing)
   - ◯ HPV testing alone (primary HPV testing)

5. **If you checked "Pap test alone,"** please indicate why you have been screening with Pap test alone instead of co-test or primary HPV test.

   Check all that apply.

   - [ ] Our patients prefer Pap testing alone
   - [ ] Our clinicians prefer Pap testing alone
   - [ ] Primary HPV testing is too expensive
   - [ ] Co-testing is too expensive
   - [ ] Primary HPV testing is not available
   - [ ] Co-testing is not available
   - [ ] Managing HPV test results is too confusing
   - [ ] Counseling patients with positive HPV test results is too time consuming
   - [ ] Other: _____

6. Based on your response to the previous question, for average-risk patients **ages 30 to 65**, with a history of **normal/negative screening results**, at that interval have you been recommending cervical cancer screening?

   Mark only one oval.

   - ◯ Annually
   - ◯ Every 3 years
   - ◯ Every 5 years
   - ◯ Other: _____

7. How have you been determining your management plans for patients with abnormal cervical cancer screening results?

   Mark only one oval.

   - ◯ 2019 ASCCP Risk-Based Management Consensus Guidelines
   - ◯ 2012 ASCCP Consensus Guidelines (algorithms)
   - ◯ Guideline from my own institution or healthcare system
   - ◯ Other: _____

8. If you are **not following** the 2019 ASCCP Risk-Based Management Consensus Guidelines, please tell us why.

   Check all that apply.

   - [ ] N/A - I am following the 2019 ASCCP Risk-Based Management Consensus Guidelines
   - [ ] I didn't realize there were new guidelines/I don't know what the updated guidelines recommend
   - [ ] I know about the guidelines but find them hard to implement in clinical practice
   - [ ] I cannot access the website or app with the 2019 guidelines in my clinic/practice setting
   - [ ] I follow the 2012 ASCCP guidelines
   - [ ] I follow my institution or healthcare system guidelines
   - [ ] I don't believe the guidelines apply to my patients

9. If you answered "I don't believe the guidelines apply to my patients," please tell us why.

   _____

10. Please rate how useful each of the following have been.

Mark only one oval per row.

	N/A - I haven't used this	Not useful	Somewhat useful	Very useful
Content learned from educational presentation by Brettany Clemens	◯	◯	◯	◯
Patient education handout	◯	◯	◯	◯
"Cheat sheet"	◯	◯	◯	◯
Shortcut to ASCCP web-based application	◯	◯	◯	◯
ASCCP web-based application	◯	◯	◯	◯
ASCCP mobile app	◯	◯	◯	◯

11. What impact, if any, has the **patient education handout** had on cervical cancer screening?

12. What impact, if any, has the **"cheat sheet"** had on cervical cancer screening?

13. What impact, if any, has the **desktop shortcut to the ASCCP web-based application** had on management of abnormal screening results?

Demographics

In this last section, we'll ask a few demographic questions.

14. What is your age?

Mark only one oval.

- ◯ < 40
- ◯ 40-49
- ◯ 50-59
- ◯ 60+

15. What is your current gender identity?

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Other: _____

16. Which of the following best describes your highest level of medical training?

Mark only one oval.

- ◯ MD/DO
- ◯ PA
- ◯ APRN
- ◯ RN
- ◯ MA
- ◯ Other: _____

Appendix G

MA/PSR Immediate Post-test

Cervical Cancer Screening and Management Questionnaire

Thank you for participating in the educational presentation and for completing this questionnaire.

First, please answer a few questions about cervical cancer screening guidelines.

1. At what age do the USPSTF 2018 guidelines recommend starting routine cervical cancer screening?

   Mark only one oval.

   - ◯ When the person first initiates sexual activity
   - ◯ Age 21
   - ◯ Age 25

Please note: Screening recommendations for ages 21-29 are rapidly evolving. For the following questions, please answer with respect to **average-risk patients ages 30 to 65**.

2. For average-risk patients **ages 30 to 65**, which of the following are acceptable cervical cancer screening tests?

   Check all that apply.

   - ☐ Pap test alone (cervical cytology)
   - ☐ Pap test plus HPV testing (co-testing)
   - ☐ HPV testing alone (primary HPV testing)

3. For average-risk patients **ages 30 to 65** with a history of **normal/negative screening results**, how often should they have a Pap test alone (cervical cytology)?

   Mark only one oval.

   - ◯ Annually
   - ◯ Every 3 years
   - ◯ Every 5 years
   - ◯ Other: _____

4. For average-risk patients **ages 30 to 65** with a history of **normal/negative screening results**, how often should they have an HPV test alone (primary HPV testing) or a co-test (Pap test plus HPV testing)?

   Mark only one oval.

   - ◯ Annually
   - ◯ Every 3 years
   - ◯ Every 5 years
   - ◯ Other: _____

Exiting Screening

For the following question, please think about patients **over age 65**.

5. Which of the following patients (all **over age 65**) can **exit** from routine cervical cancer screening?

   Check all that apply.

   - ☐ A person older than 65, regardless of history
   - ☐ A person with a history of hysterectomy with no residual cervix for non-cancerous indication and no history of CIN 2+
   - ☐ A person with no history of CIN 2+ and normal/negative routine screening during the past 10 years
   - ☐ A person who had CIN 2+ 10 years ago and normal/negative follow-up testing ever since
   - ☐ A person who had CIN 2+ 25 years ago and normal/negative follow-up testing ever since
   - ☐ A person with a history of immunosuppression (e.g., HIV, organ transplantation, exposure to DES)

Management Guidelines

Next, we'll ask a few questions about the ASCCP 2019 management guidelines.

6. On which of the following are the ASCCP 2019 management recommendations based?

   Check all that apply.

   - ☐ Algorithms
   - ☐ Current screening results
   - ☐ Past screening results
   - ☐ Immediate risk for CIN3+
   - ☐ 5-year risk for CIN3+

7. How can you access the ASCCP 2019 management guidelines?

Check all that apply.

- [ ] Free web application
- [ ] Paid mobile application
- [ ] Athena EMR

8. How likely are you to incorporate the following into your practice?

Mark only one oval per row.

	Very unlikely	Unlikely	Likely	Very likely
Content learned from educational presentation by Brettany Clemens	◯	◯	◯	◯
Patient education pamphlet	◯	◯	◯	◯
"Cheat sheet"	◯	◯	◯	◯
Shortcut to ASCCP web-based application	◯	◯	◯	◯
ASCCP web-based application	◯	◯	◯	◯
ASCCP mobile app	◯	◯	◯	◯

9. Moving forward, how would you prefer to learn about new screening and management guidelines?

Check all that apply.

- [ ] Lecture/panel discussion (in house)
- [ ] Webinar/online CME (e.g., Medscape, WebMD)
- [ ] Publications
- [ ] Local professional meetings
- [ ] State/regional professional meetings
- [ ] National professional meetings

Demographics

In this last section, we'll ask a few demographic questions.

10. What is your age?

Mark only one oval.

- ◯ < 20
- ◯ 20-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50-59
- ◯ 60+

11. What is your current gender identity?

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Other: _____

12. Which of the following best describes your highest level of medical training?

Mark only one oval.

- ◯ MA
- ◯ PSR
- ◯ Other: _____

Appendix H

MA/PSR 8-week Post-test

Cervical Cancer Screening and Management Questionnaire #2

Thank you for taking the time to complete this questionnaire. It helps us understand the impact, if any, of the educational presentation and materials on your knowledge.

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First, please answer a few questions about cervical cancer screening guidelines.

1. At what age do the USPSTF 2018 guidelines recommend starting routine cervical cancer screening?

   Mark only one oval.

   - ◯ When the person first initiates sexual activity
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Please note: Screening recommendations for ages 21-29 are rapidly evolving. For the following questions, please answer with respect to **average-risk patients ages 30 to 65**.

2. For average-risk patients **ages 30 to 65**, which of the following are acceptable cervical cancer screening tests?

   Check all that apply.

   - ☐ Pap test alone (cervical cytology)
   - ☐ Pap test plus HPV testing (co-testing)
   - ☐ HPV testing alone (primary HPV testing)

3. For average-risk patients **ages 30 to 65** with a history of **normal/negative screening results**, how often should they have a Pap test alone (cervical cytology)?

   Mark only one oval.

   - ◯ Annually
   - ◯ Every 3 years
   - ◯ Every 5 years
   - ◯ Other: _____

4. For average-risk patients **ages 30 to 65** with a history of **normal/negative screening results**, how often should they have an HPV test alone (primary HPV testing) or a co-test (Pap test plus HPV testing)?

   Mark only one oval.

   - ◯ Annually
   - ◯ Every 3 years
   - ◯ Every 5 years
   - ◯ Other: _____

Management Guidelines

Next, we'll ask a few questions about the ASCCP 2019 management guidelines.

5. On which of the following are the ASCCP 2019 management recommendations based?

Check all that apply.

- [ ] Algorithms
- [ ] Current screening results
- [ ] Past screening results
- [ ] Immediate risk for CIN3+
- [ ] 5-year risk for CIN3+

6. How can you access the ASCCP 2019 management guidelines?

Check all that apply.

- [ ] Free web application
- [ ] Paid mobile application
- [ ] Athena EMR

7. Please rate how useful each of the following have been.

Mark only one oval per row.

	N/A - I haven't used this	Not useful	Somewhat useful	Very useful
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Shortcut to ASCCP web-based application	◯	◯	◯	◯
ASCCP web-based application	◯	◯	◯	◯
ASCCP mobile app	◯	◯	◯	◯

8. What impact, if any, has the **patient education handout** had on cervical cancer screening?

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10. What impact, if any, has the **desktop shortcut to the ASCCP web-based application** had on management of abnormal screening results?

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- ◯ 40-49
- ◯ 50-59
- ◯ 60+

12. What is your current gender identity?

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Other: _____

13. Which of the following best describes your highest level of medical training?

Mark only one oval.

- ◯ MA
- ◯ PSR
- ◯ Other: _____