Spring 2021

A Multi-Faceted Quality Improvement Project Amid a Global Pandemic: Improving Guideline-Consistent Cervical Cancer Screening Rates and Provider Knowledge of Abnormal Cervical Cancer Screening Results During Reactivation of a Metro Family Practice Clinic

Taylor Villwock, AGPCNP-BC
George Washington University

GW | Nursing

DOCTOR OF NURSING PRACTICE (DNP) PROGRAM

A DNP PROJECT

TITLE:

A Multi-Faceted Quality Improvement Project Amid a Global Pandemic: Improving Guideline-Consistent Cervical Cancer Screening Rates and Provider Knowledge of Abnormal Cervical Cancer Screening Results During Reactivation of a Metro Family Practice Clinic

STUDENT NAME: Taylor Villwock, AGPCNP-BC

DNP PROJECT PRIMARY ADVISOR: Karen Whitt, PhD, AGN-BC, FNP-C, FAANP
DNP PROJECT SECONDARY ADVISOR: Jeanne Murphy, PhD, CNM, FACNM

DATE: May 2021

The George Washington University

Table of Contents

Abstract

Background: Despite the evidence-based value of cervical cancer screening, recent updates to guidelines, and general availability of the Papanicolaou (Pap) test, guideline-adherent screening rates remain low. The COVID-19 pandemic further impedes progress as preventive healthcare is delayed and patients are reluctant to enter healthcare facilities. **Objectives:** The purpose of this project was to evaluate if provider education and patient reminder letters comprising written education and risk-mitigation efforts improved cervical cancer screening rates and increased providers' knowledge of appropriate follow-up during reopening of a metro family practice clinic amid the COVID-19 pandemic. **Methods:** A multi-faceted quality improvement project included a 3-month intervention phase comprised of: (1) provider education with descriptive analysis of pre- and post-intervention knowledge of cervical cancer screening scores as well as, (2) distribution of reminder letters to 295 eligible patients. **Results:** The overall cervical cancer screening rate increased by 1% during the 3-month period. Provider questionnaire scores noted a significant increase in knowledge and intent to change practice patterns ($p<.05$) and confirmed a significant improvement in providers' knowledge of cervical cancer screening and management of abnormal cervical cytology/histology following implementation of provider education ($p<.05$). **Conclusion:** Findings indicate that provider education improves knowledge of cervical cancer screening and follow-up, as well as, fosters an intent to change practice patterns according to established guidelines. Reminder letters did provide a modest increase in cervical cancer screening rates during the COVID-19 pandemic suggesting that written education and risk-mitigation efforts can encourage patients to schedule in-person appointments.

Introduction

Human papillomavirus (HPV) is the most common sexually transmitted virus worldwide (World Health Organization, 2014) and ordinarily presents without symptoms. There are 100 types of HPV, 14 of which can cause cancer (World Health Organization, 2014). HPV either resolves spontaneously or remains as a persistent infection. Cervical cancer is primarily caused by persistent infection with "high risk" HPV; therefore, cervical cancer is largely preventable by vaccinating against HPV and by screening for precancerous lesions. Based on the woman's age and medical history, a cytological Papanicolaou (Pap) test and/or an HPV test are performed for cervical cancer screening.

In cases of cervical precancer, a distinct change in the epithelial cells of the transformation zone of the cervix is identified (World Health Organization, 2014). Precancerous changes of the cervix are classified as cervical intraepithelial neoplasia (CIN) and are graded by severity, from CIN1 to CIN3, with CIN3 being carcinoma in situ (Nardi et al., 2016). Cervical precancer may last several (10-20) years before progressing to invasive cancer, thus allowing ample opportunity for screening, detection and treatment (World Health Organization, 2014). The incidence of cases and deaths from cervical cancer have decreased in response to effective screening and treatment, yet cervical cancer remains one of the leading causes of cancer death in women worldwide (World Health Organization, 2014). This statistic is especially problematic in the wake of COVID-19, a global pandemic, which has prompted a sharp decline in preventive care. Health systems around the world are prioritizing urgent visits and delaying elective care in an effort to reduce COVID-19 transmission within healthcare settings. Telemedicine has become the gold standard; however, such visits have great limitations when it comes to preventive care such as Pap testing for cervical cancer screening.

Background and Significance

Healthy People 2020 set a target goal of screening 93% of women for cervical cancer according to the recommended guidelines (Nardi et al., 2016). COVID-19 threatens the achievement of this goal as preventive healthcare is delayed and patients are reluctant to enter healthcare facilities amid a global pandemic. Approximately 1 in 3 Americans have put off regular health care during COVID-19 (Kaiser Health News, 2020). Suspending cancer screenings indefinitely could lead to a surge of patients with delayed diagnoses and unfavorable outcomes. Within the new landscape of COVID-19, striving towards the Healthy People 2020 cervical cancer screening goal requires exploration and alleviation of barriers to guideline-consistent screening. Apart from fear of COVID-19 transmission, patient-level barriers include inadequate knowledge of the role of cancer screening, anxiety surrounding abnormal results, anticipation of discomfort during pelvic exam, embarrassment, perceived cost and access to services (Nardi et al., 2016). Access and cost are further affected by busy work schedules, lack of insurance and being unemployed (Brown et al, 2011). The leading provider-level barrier is poor understanding of complex cervical cancer screening and management guidelines (MacLaughlin et al., 2018). This provider-level barrier is further complicated by overseeing unfamiliar patients of colleagues who have been redeployed or are working remotely from home during the pandemic.

Social factors greatly influence the differential risk of contracting COVID-19 with the most vulnerable members of society hit the hardest. Those with social disadvantage have been found to underuse primary care and overuse hospital-based care (Pampel et al., 2010). Preventive visits are slowly reactivating in areas where the rate of new COVID-19 cases is controlled, yet this patient population continues to evade primary care. Wong et al (2020) conducted semi-

structured phone interviews with patients identified through purposive sampling to understand changes in behavior and attitudes towards healthcare since the start of the COVID-19 pandemic. It was found that healthcare settings are perceived as infectious reservoirs and patients are not well-informed of the current risk-mitigation efforts at such settings (Wong et al, 2020).

Low socio-economic status (SES) underlies key determinants of health including health care, health behavior and environmental exposure. The cumulative effects of social disadvantage across stages of the life cycle present immense challenges for an urban practice site and its healthcare providers. Providers are responsible for managing a great level of biomedical morbidity while confronting and navigating a complicated web of psychosocial barriers. Minority populations are disproportionately affected by cervical cancer (Nardi et al., 2016). "Black women account for 8.9 of 100,000 new cases and the incidence in Hispanic women is 9.4 per 100,000 cases, compared with 7.5 per 100,000 cases for white women" (Nardi et al., 2016). Screening rates are also lower for Hispanic and African American women at 77% and 82.13%, respectively (Nardi et al., 2016). A number of economists claim that "the lower lifetime earnings and wealth of low-SES groups give them less reason to invest in future longevity and more reason to focus on the present in making decisions about health behaviors" (Pampel et al., 2010).

Cervical cancer yields substantial economic burden on the population and the nation's health system. In 2019, an estimated 13,170 cases of invasive cervical cancer were diagnosed in the United States with an estimated 4,250 deaths (American Cancer Society, 2019). A mixed methods study performed by Nwankwo et al (2019) revealed that "total healthcare costs were $4,221 higher, and an additional 0.37 workdays were missed in women with cervical cancer compared to propensity-matched controls." Increasing compliance with cervical cancer screening guidelines is cost effective. According to Chesson et al (2012), approximately 52 million Pap

tests are performed in the U.S. annually with an average cost of $103 per cervical cancer screening. Compared to nonadherent screening practices, guideline-based cytologic screening results in greater cancer prevention (80.9% incidence reduction; 86.7% mortality reduction) and a lower incremental cost-effectiveness ratio (ICER) (Kim et al., 2015). In the setting of value-based care and increased pressure to reduce healthcare costs, the cost-saving potential of proper preventive care should not be overlooked.

Needs Assessment

A needs assessment was conducted to evaluate the strengths, weaknesses, opportunities, and threats (SWOT), as well as, identify the barriers and facilitators for conducting the proposed project at RiverCenter clinic. The following report is illustrated as a SWOT diagram in Appendix A.

Barriers

Advocate Aurora Health - RiverCenter clinic manages a large volume of patients, many of whom are of low SES with subsequent disparities in health status, morbidity and mortality. Health disparity translates to increased medical complexity and extensive active problem lists. Low SES is associated with less utilization of preventative and early detection services (American Psychological Association, 2020). Low SES impacts transportation, insurance status, ability to pay and access to medical screening (American Psychological Association, 2020). Missed appointments and insurance gaps as well as cost of diagnostic testing and follow-up notably reduce rates of health maintenance adherence.

RiverCenter experienced a surge in primary care provider (PCP) turn-over due to relocation and early retirement in the setting of a global pandemic, thus increasing the risk of patients lost to follow-up. Moreover, COVID-19 led to the expansion of telehealth or virtual care

and the redeployment of several primary care providers. Consequently, preventive exams requiring an in-person appointment such as cervical cancer screening have been deferred with under-utilization of important medical services. The system lacked standardization for communicating the need for cervical cancer screening. Lack of consistent processes impeded effective outreach and patient education to ensure periodic care is performed based on level of risk. RiverCenter is a busy practice, which increases the number of competing demands and reduces the availability of providers, ancillary staff members and leadership.

Facilitators

RiverCenter encompasses a strong team-work mentality founded on a culture of collaboration. The loss of multiple PCPs and medical assistants gave rise to an influx of new employees who are motivated to excel and eager to learn. RiverCenter is equipped with an experienced, efficient and diverse Registered Nurse (RN) staff. RNs triage, offer comprehensive education and work directly with PCPs to coordinate patient care. RiverCenter has an on-site application support information technologist, a quality improvement representative and an organizational nursing research scientist who are well-versed in data retrieval, analysis and management. RiverCenter maintains meaningful use of an interoperable electronic medical record (EMR) as proposed by the Health Information Technology for Economic and Clinical Health (HITECH) Act.

Advocate Aurora Health established a robust ambulatory reactivation plan across its clinical sites including a Safe Care Promise, which details mandatory safety measures that have been implemented to protect patients seeking care and team members providing care during COVID-19. Leadership has a clear vision of success, supports professional development and is

committed to continuous growth of the organization. Leadership prioritizes interpersonal, transparent and consistent communication.

Problem

Cervical cancer screening has reduced the incidence of cervical cancer death by more than 60% since its introduction in the 1950s (Rosenberg, 2019). Evidence shows that cervical cancer mortality typically occurs among unscreened women. According to the American Cancer Society (2019), early detection through Pap testing greatly increases the five-year survival rate for women with cervical cancer. When cervical cancer is diagnosed as localized, the five-year survival rate is 92% (American Cancer Society, 2019). If the cancer spreads to a different part of the body, the five-year survival rate is reduced to 57.4% (Nardi et al., 2016). Despite the evidence-based value of cervical cancer screening, recent updates to guidelines, and general availability of the Pap test, guideline-adherent screening rates remain low (Rosenberg, 2019). During COVID-19, guideline-adherent cervical cancer screening rates dropped even further across the United States. Appointments for cervical cancer screening fell by 94% compared to the 2017-2019 averages (Epic Health Research Network, 2020). If this trend continues, many cancer cases will likely go undiagnosed or be diagnosed at a later stage with a poorer prognosis (Epic Health Research Network, 2020).

Erroneous cervical cancer screening practices yield substantial consequences. As reported by Subramaniam et al (2011), approximately 50% of invasive cervical malignancies are diagnosed in patients that have never been screened and 10% of the remaining cervical cancer patients have not had a Pap smear in the five years prior to diagnosis. Conversely, over-screening yields needless healthcare expenditures, patient inconvenience as well as potential patient harm from false-positive results and subsequent unnecessary invasive procedures (Hills et al., 2015).

Evidence from review of the literature deemed provider training, patient education and patient reminders to be successful methods for enhancing appropriate cervical cancer screening. A needs assessment conducted within RiverCenter family practice clinic revealed the need to implement such strategies to increase the rate of guideline-consistent cervical cancer screening and follow-up during its reactivation. RiverCenter's cervical cancer screening quality improvement data revealed a Pap completion rate of 87% for August 2020, which was expected to decline in the setting of delayed preventive care visits.

Purpose

The purpose of this project was to evaluate if provider training as well as patient reminders comprising written education and risk-mitigation efforts improved guideline-consistent cervical cancer screening rates and increased providers' knowledge of appropriate follow-up among eligible female patients during reopening of a large metro family practice clinic in the wake of COVID-19.

Aims

The first aim was to meet or exceed Healthy People 2020's target goal of screening 93% of eligible female patients for cervical cancer by January 2021. The second aim was to improve providers' knowledge of guideline-consistent routine screening and follow-up for abnormal Pap testing by 10% from baseline.

Literature Review

Review of the Evidence

A literature review was conducted in order to systematically investigate evidence of best practice concerning interventions for improving guideline-consistent cervical cancer screening rates and follow-up of abnormal results within the primary care setting. Review of the literature

focused on provider training, patient education and patient reminders as means to increase cervical cancer screening rates. Articles were searched from PubMed and CINAHL. Preceding the search, a librarian was consulted and subsequently advised exploration of these databases. Articles were accessed through the Himmelfarb Health Sciences Library website and search strategies were tailored according to each individual database. Several keywords were utilized, in various combinations, while searching the databases: papanicolaou (pap) smear, pap testing, clinical decision support, cervical cancer, cervical cancer screening, training, education, reminder, abnormal pap, provider adherence and guidelines. Keywords were connected with the Boolean operators “and” and “or.” A total of 445 citations were initially identified. It is important to note that the number of citations generated was contingent on the specific variation of keywords used. To make the screening process less cumbersome, pertinent titles and abstracts of articles in each database were explored further and accepted or rejected based on inclusion and exclusion criteria. Duplicate studies were then eliminated. As a result of such editing, approximately 15 articles were deemed relevant. The Johns Hopkins evidence appraisal tool was used to evaluate the strength of the literature. Among the relevant articles, 5 were rejected for inferior quality and disparate outcome measures. The articles that were identified are organized into a table of evidence in Appendix B.

Eligible studies referenced compliance with outpatient cervical cancer screening among biological females. More specifically, eligible studies were written in English, of USA or Canada geographic subset, published within the last 10 years and offered access to full-text. Ineligible studies included those that examined, exclusively, patient education interventions other than written material and patient outreach via phone call. Studies were discarded if they focused on a specific patient ethnicity other than ethnically diverse black women. Studies focusing on black

women were considered applicable as RiverCenter is a city-based clinic serving a large percentage of ethnically diverse black patients. Furthermore, it is of value to understand cervical cancer screening rates from an ethnically diverse perspective in view of epidemiological data, which shows that black women have high rates of cervical cancer and are more likely to die from the disease than women of other races (Brown et al., 2011). There is a well-defined association between inadequate screening and socioeconomic, geographic and racial disparities (Hills et al., 2015). Female patients who have low income and educational level, those who are uninsured, and those who have immigrated to the United States in the past 10 years account for the majority of cervical cancer cases (National Center for Health Statistics, 2011).

Provider Knowledge, Adherence and Training

Risk for developing cervical cancer rises exponentially in women who have never received screening, have been screened erroneously, and have delayed or no follow-up of abnormal results (MacLaughlin et al., 2018). Studies of clinician application of the American Cancer Society (ACS) and the American Society for Colposcopy and Cervical Pathology (ASCCP) screening guidelines reflect low levels of understanding and compliance (Teoh et al., 2015). A non-experimental cross-sectional survey conducted by Boone et al. (2016) determined that distrust and confusion likely limit adherence to current evidence-based cervical cancer screening health policy recommendations. A total of 4,909 randomly selected primary care providers (physicians, nurse practitioners, and physician assistants) practicing in California were mailed a study questionnaire. Of the 1,268 qualified responses received, 35.0% of all primary care providers deemed current guidelines clinically inappropriate. Among those who affirmatively believed current guidelines were “authoritative, reliable, and clinically

appropriate," only 15.3% recommended screening intervals consistent with that of current policy guidelines (Boone et al., 2016).

Teoh et al (2015) performed a similar survey-based study, which sought to evaluate knowledge, reported practices, and interpretations of the 2012 cervical cancer screening guidelines among 325 health care providers in a large health maintenance organization. Of the 124 respondents, 12.1% reported they were not aware of the 2012 guideline changes and only 5.7% answered all the knowledge questions correctly. A majority of respondents reported correct screening practices in the 21–29 year patient age group (65.8%) and in the >65 year patient age group (74.3%). Appropriate screening intervals in the 30–65 year patient age group varied by modality, with 89.3% correctly screening every 3 years with Pap smear alone, but only 57.4% correctly screening every 5 years with Pap smear and human papillomavirus contesting (2015). Across all patient age groups, the most frequently cited reasons for poor adherence were lack of knowledge of the guidelines and patient demand for a different screening interval. As the patient age group increased, a greater percentage of providers reported patient demand as a reason for guideline nonadherence. As the patient age group increased, a lesser percentage of providers reported lack of knowledge as a reason for guideline nonadherence. Hills et al. (2015) found that individual provider educational outreach in a primary care setting contributes to a decrease in over-screening (9.8% to 2.9%) and under-screening (52.1% to 24.7%) among patients with a high vulnerability risk profile. White and Kenton (2013) implemented changes to the EMR and delivered lectures to educate providers on cervical cancer screening guidelines. Following this intervention, the total number of Pap tests done on adolescents decreased by 34% and appropriate follow-up for abnormal results improved by 8%. However, the overall numbers of abnormal results were very low, making it difficult to determine whether any improvements in

management truly related to the implemented EMR changes (White & Kenton, 2013). Because this was a retrospective review of all screened adolescents during a single calendar year rather than following a group of specific physicians' practice patterns over a period, the study is unable to control for changes in faculty and resident staff (White & Kenton, 2013).

Patient Education and Reminders

Some studies focused on the importance of considering a patient's cultural beliefs and practices when examining barriers and designing educational programs for cervical cancer screening. Brown et al. (2011) conducted six focus groups with forty-four Haitian, African, English-speaking Caribbean and African American women recruited from a federally qualified health center in Essex County, New Jersey. The small, qualitative sample of primarily low-income black women may limit the generalizability of this study; however, the following findings are still thought-provoking. Brown et al. (2011) discovered that all ethnic groups possessed limited knowledge and confusion about cervical cancer, risk factors, Pap testing and human papillomavirus (HPV). Still, differences between ethnic groups in knowledge, cultural beliefs and practices were evident. These findings suggest the need to provide culturally-based information about the importance of screening and its role in maintaining one's personal health.

A systematic review and metanalysis performed by Musa et al. (2017) similarly examined the use of culturally-sensitive, linguistically-diverse education and its positive influence on patient participation in cervical cancer screening. The use of theory-based education increased cervical cancer screening rates by over 50% and sending invitation/reminder letters to patients similarly increased the uptake of cervical cancer screening (Musa et al., 2017). A systematic review of interventional studies performed by Ghare et al. (2018) concluded that developing patient knowledge and promoting patient awareness through educational intervention

and clear communication leads to a change in health behavior (2018). Mailed patient reminders increased Pap testing usage by 18.8% (Ghare et al., 2018).

Other studies indicated that educating patients with written materials may be a beneficial way to improve cervical cancer screening rates. Mazor (2014) conducted a randomized controlled trial among 527 insured women ages 40 to 65 years in Georgia, Massachusetts, Hawaii and Colorado with the intent to investigate the association between health literacy and cervical cancer screening. Forty-five percent of the women in this study had at least a bachelor's degree and 42% reported their race as white, non-Hispanic. Spoken health literacy was associated with screening behaviors in this population, suggesting that it has independent effects beyond those of access to care. Women in the study had difficulty understanding spoken recommendations about cancer screening. The authors concluded that education written in plain-language may be beneficial for all regardless of health literacy level. Feldmen et al. (2017) cultivated education and communication through implementation of mailed personalized recall letters and inclusion of educational brochures for eligible patients in a multi-site urban practice. Cervical cancer screening rates increased from 60% pre-intervention to 71% ($p<0.05$) post-intervention.

Several congruent themes emerged from the literature. Providers' lack of knowledge, misinterpretation and distrust contributes to poor adherence to current cervical cancer screening guidelines. The complexity of the current algorithms for cervical cancer screening and management of abnormal results warrants further provider training. Patient knowledge about cervical cancer and its risk factors, the Pap test, and the human papillomavirus (HPV) is limited. Personalized reminder letters for patients as well as provider and patient educational outreach are similarly effective methods to increase cervical cancer screening rates. Of note, patients often

have difficulty understanding spoken recommendations about cancer screening; therefore, greater benefit is gained from written education using simple language.

Evidence-Based Practice Model

The Johns Hopkins Nursing Evidence-Based Practice Model

The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model was selected to guide implementation of this project. JHNEBP fosters a problem-solving approach to clinical decision making by utilizing a three-step process called PET: practice question, evidence and translation (Dang & Dearholt, 2017). The goal of this model is to effectively incorporate the latest research findings and best practices into patient care (Dang & Dearholt, 2017).

Practice Question

Within a large family practice clinic that is reopening in-person preventive care visits during COVID-19, does implementing provider training and patient reminders comprising written education and risk-mitigation efforts increase guideline-consistent cervical cancer screening rates and enhance providers' understanding of appropriate follow-up among eligible female patients ages 21-64 years?

Evidence

Literature was explored to address the derived practice question. Articles were then reviewed and appraised using the Johns Hopkins Evidence and Quality Guide (Dang & Dearholt, 2017). Each article received strength of evidence as well as quality rating scores. Level I constitutes the strongest level of evidence and includes randomized controlled trials or meta-analysis of randomized control trials. Level II is comprised of quasi-experimental studies. Level III contains non-experimental and qualitative studies as well as meta-synthesis of qualitative research. Level IV reflects the opinion of nationally recognized experts based on research

evidence. Level V reflects the opinion of individual expert based on non-research evidence. Each scientific evidence is also assigned a quality rating of A, B, or C. The highest quality evidence is assigned to articles with consistent and definitive results, adequate sample size, and extensive review of literature reflecting scientific evidence. Through review of the literature, it was determined that sufficient higher-level evidence exists to suggest that provider training, patient education and patient reminders are successful methods for enhancing appropriate cervical cancer screening.

Translation

This step involved determining the viability of translating recommendations into the specific practice setting. An action plan was created and implemented. Milestones were assigned a scheduled time for completion and pre/post observable measures were identified. Outcomes and positive findings were then disseminated. Please refer to the Methods and Evaluation sections for further details.

Methods

Design

The methodology chosen for this project was based on the literature search, which supported provider training and patient reminders comprising written education as interventions to increase guideline-consistent cervical cancer screening rates and improve providers' knowledge of managing abnormal cervical cytology/histology amid reopening of in-person preventive care visits at a large metro family practice clinic. Such interventions were derived from empirical and theoretical review of the literature. The project design is a multi-faceted, institution-based quality improvement project.

Setting

This quality improvement (QI) project was conducted at Aurora Health Center - RiverCenter, a large family practice clinic in metro Milwaukee, Wisconsin. Advocate Aurora Health is one of the ten largest not-for-profit integrated health systems in the United States. The zip code (53212) in which RiverCenter clinic is located has been designated as a lower socioeconomic status (SES) precinct with a large population density (Greer et al, 2013). Individuals residing within this zip code are primarily African American with a median household income of $29,653 and an unemployment rate above the state average (United States Zip Codes, 2020). Fifty-one percent of the population is female, while 49% are male (United States Zip Codes, 2020). The median age of the population is 28.9 years (United States Zip Codes, 2020).

Participants

Patients

Inclusion criteria for patients who were identified to receive written education and reminders consisted of females ages 21-64 years with a listed primary care provider at RiverCenter clinic. Such patients must have been evaluated in-person by a provider at RiverCenter clinic on at least 2 separate occasions. Exclusion criteria for patients included history of total hysterectomy (unless procedure was performed as treatment for cervical pre-cancer or cancer) or retaining a hospice code within the last 12 months. According to August 2020 clinic data there were 2,268 eligible female patients, 295 of whom were overdue for cervical cancer screening.

Providers

Primary care providers (two female nurse practitioners, two female physician assistants, two male physicians, and four female physicians) employed by RiverCenter clinic were invited

to participate in a questionnaire/survey and education intervention. In order to meet study eligibility criteria, providers must work at least a 0.5 full-time equivalent (FTE) as a primary care provider at RiverCenter clinic.

Interventions

A methodology map of the following interventions can be found in Appendix C.

Patient Reminder Letters

The overall clinic's monthly cervical cancer screening compliance score (%) was calculated by the clinic's Quality Improvement Representative (QIR). The QIR identified all eligible females due for cervical cancer screening using an electronic query of the electronic medical record (EMR). The cervical cancer screening score for August 2020 served as the clinic's baseline (pre-intervention) data. As of August 2020, 87% of 2,268 total eligible patients at RiverCenter clinic received cervical cancer screening according to guidelines; therefore, 295 patients remained overdue for cervical cancer screening.

A patient reminder letter was created with a description of risk mitigation efforts in place during COVID-19 and an educational brochure on cervical cancer screening approved by Advocate Aurora Health (Appendix D). This letter was then imported into the EMR for convenience. The QIR delivered identifiable data of patients due for cervical cancer screening directly to two selected front desk agents, also known as Patient Service Representatives (PSR), who then accessed the letter in the EMR and executed the reminder mailing process. Aside from assembling and mailing patient reminder letters, the PSRs also manually tracked letters sent.

Provider Education and Questionnaire

REDCAP software was utilized to create a modified pre- and post-education provider questionnaire based on the *National Survey of Primary Care Physicians' Cancer Screening*

Recommendations and Practices cervical cancer screening questionnaire adopted from the National Cancer Institute in collaboration with the Agency for Healthcare Research and Quality and Centers for Disease Control and Prevention (Appendix E). This survey applies validated instruments to assess clinicians' "adoption of new or rapidly-evolving screening technologies and new screening guidelines, as well as their use of informed decision-making in discussing cancer screening with their patients, and practice-based systems that support and/or otherwise influence screening activities" (National Cancer Institute, 2019). The cervical cancer screening feature of this survey was utilized to identify providers' practice patterns as well as knowledge of cervical cancer screening and management of abnormal Pap test results. Clinical vignettes were adopted from the validated survey as well as from current recommendations presented by the US Preventive Services Task Force (USPSTF) and the American Society for Colposcopy and Cervical Pathology (ASCCP). Clinical vignettes have been shown to be a valid and cost-effective method for assessing the quality and processes of clinical care, including cancer screening (Peabody et al, 2004). The questionnaire was approved by Advocate Aurora Health's Institutional Review Board (IRB) and by the Research Subject Protection Program (RSPP).
Of note: A portion of the *National Survey of Primary Care Physicians' Cancer Screening Recommendations and Practices* is based on providers' reports of their recommendations and practices. Self-reported data was not validated with other data sources such as medical records or claims. Formal permission to utilize this questionnaire was not required. Survey participation was voluntary.

Provider education was initially intended to be delivered during an in-person staff meeting. Due to the COVID-19 pandemic, in-person staff meetings ceased. Instead, an education/training module was constructed and recorded using Microsoft PowerPoint. The

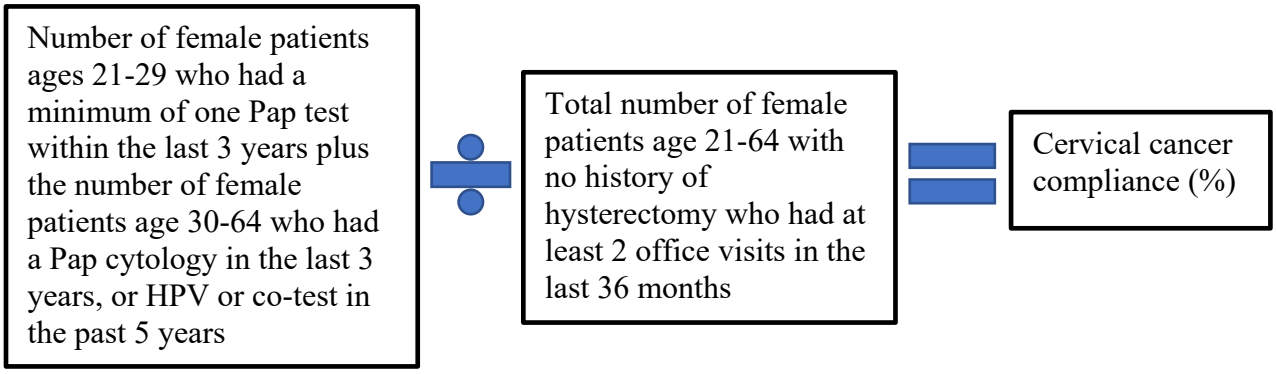
provider education module was designed based on gaps in knowledge identified on providers' pre-intervention questionnaire responses. Information conveyed in the module covered the 2018 US Preventive Services Task Force (USPSTF) cervical cancer screening guidelines as well as management of abnormal cervical cytology and histology results as recommended by the American Society for Colposcopy and Cervical Pathology (ASCCP). The education module was emailed to all providers along with a link for accessing the post-education questionnaire. All providers were emailed a reminder after 1 week to complete the questionnaire. The questionnaire was closed 2 weeks from the time it was sent. The questionnaire took approximately 20-30 minutes to complete.

Data Collection and Analysis

Refer to Appendix F for the data collection/evaluation and analysis methods table, which summarizes the information detailed below.

Patient Reminder Letters

The following calculation was performed electronically to obtain cervical cancer screening compliance scores:



Once received from the QIR, the aggregated monthly cervical cancer screening scores were entered and saved into a designated Excel spread sheet. Social Sciences Statistical Package

(SPSS) software was then used to generate a run chart to analyze cervical cancer scores over time. Through electronic query of the EMR, the QIR was also able to track the number of completed cervical cancer screenings among the 295 patients that received a reminder letter.

Provider Education and Questionnaire

Anonymous provider questionnaire responses were collected in a designated Excel spread sheet. Questions 7a-7g, 8a-8c, 11-20 on the survey were marked as either incorrect or correct. There were a total number of 20 questions that counted towards the overall score. Correct answers were given 1 point for a total possible score of 20. The total possible score out of 20 was calculated and expressed as a percent for each provider. Descriptive statistics (mean and standard deviation) were analyzed through SPSS software and compared after the pre- and post-education questionnaires were closed.

Questions 1-6 and 9-10 focused on primary care providers' attitudes, recommendations, and practices toward use of established and emerging technologies as well as guidelines for cervical cancer screening. While the purpose of this project did not require further analysis of these questions, they were helpful in understanding the aforementioned factors that support and/or influence providers' screening activities. A Likert scale was used to determine providers' perception of efficacy among various cervical cancer screening procedures, degree of influence among various screening guidelines, as well as the level of agreement regarding the use of HPV DNA testing in predicting cervical cancer and the impact of HPV vaccination on cervical cancer screening practices. Question 21 was added to the post-education questionnaire to evaluate providers' perceptions of change in knowledge and practice patterns after reviewing the education.

Ethical Considerations

This DNP project was guided by ethical principles of autonomy, beneficence, non-maleficence and justice.

Autonomy

Patients received comprehensible written education about cervical cancer screening in order to foster informed decision-making. The right of the patient to decline medical care, including cervical cancer screening, is honored by all providers. All patient data for this study was collected as part of routine care (i.e. measuring and reporting provider performance data for clinic use), therefore regulations for the protection of human subjects did not apply. There was no burden placed on a patient beyond that of routine care, therefore there was no requirement for such activities to be conducted with patient informed consent. No individually identifiable patient data was accessible to the author for analysis.

The author does not have any supervisory relationship with the providers at RiverCenter clinic. Providers were informed of the quality improvement interventions through an induction session. Prior to survey engagement, providers were notified of voluntary participation. No penalties or incentives were applied based on personal choice to respond, thus eliminating the threat of pressure or coercion. Survey completion implied provider consent.

Beneficence and Non-maleficence

Providers and patients at RiverCenter clinic were anticipated to benefit from this project, which aimed to improve the quality of patient care and outcomes while employing minimal risk to its participants. An objective of this project was to increase guideline-consistent cervical cancer screening rates, thereby reducing imposed patient risk associated with over and under-screening practices. Furthermore, the organization's Safe Care Promise was included in the

patient's reminder letter in an effort to relay risk mitigation efforts in place during COVID-19. Interventions implemented in this project were consistent with evidence-based practice.

All patients eligible to receive a reminder and educational letter were identified through electronic query of EMR data. In order to remain in compliance with the Health Insurance Portability and Accountability Act (HIPAA), letters did not contain any sensitive information for individual patients. Cervical cancer screening compliance rates were collected in aggregated form. Data collection and analysis was supervised by individuals who have been trained to carry out QI and clinical audit projects. Access to patient data was limited to involved staff at RiverCenter clinic. The EMR maintains an audit trail to ensure that patient data is obtained lawfully. Survey information provided by physicians and advanced-practice clinicians remained confidential and free of identifying data.

Justice

Inclusion and exclusion criteria for eligible patients did not comprise socioeconomic variables such as racial group, ethnic group, marital status, financial standing or level of education. This project endeavored to improve cervical cancer screening rates and appropriate follow-up irrespective of a population's socio-demographic characteristics.

Clinical Resources and Cost

RiverCenter clinic has access to an organizational nursing research scientist as well as a quality improvement representative and an application support tech (IT) who assisted with data retrieval and management. These resources were utilized to ensure appropriate data elements were identified for measurement metrics.

Time represents the greatest resource and "cost" as there was limited monetary expenditure for printing patient letters and educational brochures. Provider education was

electronically delivered at no cost. Meeting spaces were located within the practice setting and were widely available to use free of charge. Meetings with aforementioned team members and providers were held during work hours, therefore no over-time pay or extension of FTE was required.

Results

Patient Reminders Letters

All 295 patient letters were delivered from 10/01/20 - 12/01/20 with 68 of those patients completing cervical cancer screening at the clinic. Following dissemination of patient reminder letters encompassing education and risk-mitigation efforts practiced during the COVID-19 pandemic, the clinic's overall cervical cancer screening score increased by 1% (Appendix G, Figure 1).

According to the Medical College of Wisconsin Institute for Health and Equity & Wisconsin Electronic Disease Surveillance Systems (2021), a total of 9,460 COVID-19 cases in Milwaukee County have been identified since the first confirmed case on 03/06/20. Refer to Appendix G (Figure 2) for an extract of the daily incidence of new cases and the average daily incidence within the last 7 days (Wisconsin Electronic Disease Surveillance System, 2020). The highest daily case count since the beginning of the pandemic occurred on 11/09/20 with 1,689 cases in Milwaukee County overall. At the time of data collection for all confirmed cases, 47% were male and 53% were female. Despite the escalation in COVID-19 cases and higher rate of infection among females, RiverCenter clinic achieved and maintained an increase in cervical cancer screening rates.

Provider Education and Questionnaire

Pre-education Provider Questionnaire

Eight out of ten eligible primary care providers at RiverCenter clinic completed the pre-intervention questionnaire, which yielded an 80% response rate. Analysis of descriptive statistics (mean and standard deviation) revealed a mean provider score of 73.13% and a standard deviation of 8.84. Questions regarding frequency of routine cervical cancer screening based solely on age were answered correctly by 100% of providers. Less than 40% of the providers answered questions 8c, 11, 14, 17, and 20 correctly. These questions examined appropriate follow-up for women over 30 years of age with ASC-US, younger than 25 years of age with LSIL or higher, and screening guidelines for those who are immunocompromised as well as for women ages 65+. Refer to Appendix G (Figure 3) for the percentage of providers who answered each question or group of questions correctly on the pre-education questionnaire.

In a typical month, the majority of providers personally order or perform cervical cancer screening with Pap testing on 1-10 asymptomatic average-risk female patients. One hundred percent of providers use liquid-based cytology for cervical cancer screening and order HPV testing either for routine or follow-up testing. Providers are more inclined to refer to Gynecology for management of patients age 30 years and older with abnormal Pap test results (ie ASC-US, HPV positive).

Refer to Appendix G (Tables 1-3) for a summary of the following findings: Providers considered the U.S. Preventive Services Task Force to be the most influential cervical cancer screening guideline in their practice. Although there was variation in the perceived effectiveness of screening with conventional and liquid-based cytology in reducing cervical cancer mortality in average-risk women, 100% of providers agreed that HPV DNA with Pap test is very effective. The majority of providers strongly agreed that HPV DNA testing with Pap testing is more accurate than Pap test alone in predicting cervical cancer and that completion of the HPV

vaccine series does not impact when cervical cancer screening is initiated. One hundred percent of providers strongly disagreed that completing the HPV vaccine series impacts how often a patient is screened for cervical cancer.

Post-education Provider Questionnaire

Seven out of ten providers viewed the electronic training module and completed the post-education questionnaire. Data revealed a mean provider score of 91.43% and standard deviation of 6.90. The post-education questionnaire score increased by 18% from baseline (Appendix G, Figure 4). An increase was noted in the percent of providers who answered each question or group of questions correctly following the educational intervention. There was 1 question (#12) out of 20 questions total in which a decrease was found in the percent of providers who answered correctly; however, this finding was attributable to a decrease in the number of providers who completed the post-education questionnaire. Seventy-five percent, or 6 out of 8 providers, answered question 12 correctly on the pre-education questionnaire. Approximately 71%, or 5 out of 7 providers, answered question 12 correctly on the post-education questionnaire. Refer to Appendix G (Figure 5) for the percentage of providers who answered each question or group of questions correctly on the post-education questionnaire and Appendix G (Figure 6) for a comparison to the pre-intervention questionnaire.

Six out of seven providers strongly agreed that their knowledge of cervical cancer screening and management of abnormal Pap results improved by reviewing the educational module. Three out of seven providers somewhat agreed and three of out seven providers strongly agreed that their practice patterns will change as a result of reviewing the education offered. A nonparametric Wilcoxon signed ranks test was performed through SPSS software to evaluate the impact of training on providers' knowledge of cervical cancer screening as well as management

of abnormal cervical cytology and histology. Results of the Wilcoxon signed rank test revealed that the providers' post-education knowledge scores were significantly higher than pre-education scores ($z = 21$, $p = 0.02$). Thus, a statistically significant improvement in providers' knowledge of cervical cancer screening as well as management of abnormal cervical cytology and histology was observed following implementation of provider education.

Discussion

Amid a global pandemic where preventive health and cancer screenings have largely been deferred, this project demonstrated a simple and cost-effective process for enhancing provider knowledge and communicating the need for cervical cancer screening. The clinic did not meet Healthy People's 2020 objective of screening 93% of women for cervical cancer. Nevertheless, the clinic did achieve a modest increase in cervical cancer screening rates following implementation of reminder letters, which implies the value of messaging and clear communication to encourage overdue women to be screened. Increased guideline-consistent screening, rescreening and surveillance practices will ultimately reduce rates of cervical cancer incidence and death. Provider training has the potential to lessen variability in interpretation and management of screening results. Enhanced provider knowledge of current clinical guidelines could reduce over- and under-treatment of cervical abnormalities at the cellular level, thereby minimizing the risk of psychological stress and impairment to patients' cervical health.

Limitations

A small sample size for the provider questionnaire limits inferences that can be made from data analysis. Survey responses were presented in aggregate form, which excluded the ability to compare pre- and post-questionnaire findings of the same provider. A short intervention and data collection interval makes it difficult to conclude that patient reminder letters are not considerably

effective. Furthermore, the socioeconomic status of patients was not identified hindering the ability to draw associations between letter reminders and other variables in Pap smear completion.

Recommendations and Sustainability

Given the minor increase in cervical cancer screening rates following implementation of patient reminder letters, an alternative screening method should be explored for patients who cannot or prefer not to have in-person appointments during the COVID-19 pandemic. Although not yet approved by the Food and Drug Administration (FDA), home-based HPV testing is a promising strategy for expanding accessibility of cervical cancer screening, especially in an era of social-distancing. According to Gupta et al. (2018), "self-sampling instead of clinician-sampling has proven to be equally accurate, in particular for assays that use nucleic acid amplification techniques." Several studies have shown that the majority of women who tested HPV-positive in a self-obtained sample will schedule an appointment for follow-up diagnosis and management (Gupta et al., 2018). Self-collected HPV testing would provide an opportunity for improved adherence to screening guidelines by eliminating some of the barriers to in-office cervical cancer screening including time, cost, and perceived distress of gynecological examinations.

Ongoing monitoring of cervical cancer screening rates and distribution of patient reminder letters is needed to ensure that improvements made will be sustained over time. It would be beneficial to conduct patient interviews about barriers and facilitators to screening in order to inform effective messaging. Additional strategies need to be explored to address compliance, health literacy and access-to-care barriers among a largely vulnerable patient population. In order to sustain up to date knowledge of cervical cancer screening guidelines, the

education module could be added to existing mandatory provider education with revisions made as necessary.

References

American Cancer Society (ACS). (2019). *Cancer facts & figures.* Retrieved from https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2019.html

American Psychological Association. (2020). *End-of-life & socioeconomic status fact sheet.* Retrieved from https://www.apa.org/pi/ses/resources/publications/end-life

Boone, E., Lewis, L., Karp, M. (2016). Discontent and confusion: Primary care providers' opinions and understanding of current cervical cancer screening recommendations. *Journal of Women's Health, 25*(3), 255-262. Retrieved from http://dx.doi.org.proxygw.wrlc.org/10.1089/jwh.2015.5326

Brown, D. R., Wilson R. M., Boothe, M. A., & Harris, C. E. S. (2011). Cervical cancer screening among ethnically diverse black women: Knowledge, attitudes, beliefs, and practices. *Journal of the National Medical Association, 103*(8), 719–728. doi:10.1016/S0027-9684(15)30411-9.

Centers for Disease Control and Prevention. (2020). *Coronavirus disease 2019 (COVID-19): How it spreads.* Retrieved from https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html

Chesson, H.W. et al. (2012). Estimates of the annual direct medical costs of the prevention and treatment of disease associated with human papillomavirus in the United States. *Vaccine, 30*(42), 6016-6019. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6629018/

Dang, D. & Dearholt, S. (2017). *Johns Hopkins nursing evidence-based practice: Model and guidelines.* 3rd ed. Indianapolis, IN: Sigma Theta Tau International

Epic Health Research Network. (2020). *Delayed cancer screenings.* Retrieved from https://ehrn.org/delays-in-preventive-cancer-screenings-during-covid-19-pandemic/

Feldman, J., Davie, S., Kiran, T. (2017). Measuring and improving cervical, breast, and colorectal cancer screening rates in a multi-side urban practice in Toronto, Canada. *BMJ Quality Improvement Reports, 6*(1). doi: 10.1136/bmjquality.u213991.w5531

Ghare Naz, M.S. et al. (2018). Educational interventions for cervical cancer screening behavior of women: A systematic review. *Asian Pacific Journal of Cancer Prevention, 19*(4), 875-884. doi: 10.22034/APJCP.2018.19.4.875

Greer, D.M., et al. (2013). Milwaukee health report 2013: Health disparities in Milwaukee by socioeconomic status. *Center for Urban Population Health.* Retrieved from https://www.cuph.org/uploads/2/5/8/5/25855930/mhr_2013_final.pdf

Gupta, S., et al. (2018). Self-sampling for human papillomavirus testing: Increased cervical cancer screening participation and incorporation in international screening programs. *Frontiers in Public Health, 6*(77). Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5900042/

Hayes, H., Parchman, M.L, Howard, R. (2011). A logic model framework for evaluation and planning in a primary care practice-based research network (PBRN). *Journal of the American Board of Family Medicine, 24*(5), 576-582. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3266837/

Hills, R.L., Kulbok, P.A. & Clark, M. (2015). Evaluating a quality improvement program for cervical cancer screening at an urban safety net clinic. *Health Promotion Practice, 16*(5), 631-641. doi: 10.1177/1524839915587269

Institute for Healthcare Improvement. (2012). *Initiatives: The IHI triple aim.* Retrieved from http://www.ihi.org/Engage/Initiatives/TripleAim/Pages/default.aspx

International Monetary Fund. (2020). *Policy responses to COVID-19.* Retrieved from https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

Kaiser Health News. (2020). *KHN morning briefing.* Retrieved from https://khn.org/morning-breakout/putting-off-health-care-31-of-all-americans-delay-trips-to-doctors-more-than-50-of-seniors-cancel-appointments/

Karjane, N.W. et al. (2017). Cervical screening. *Medscape.* Retrieved from https://emedicine.medscape.com/article/1618870-overview#a2

Kim, J.J. et al. (2015). Inefficiencies and high-value improvements in U.S. cervical cancer screening practice: A cost-effectiveness analysis. *Annals of Internal Medicine, 163*(8), 589-597. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5104349/

MacLaughlin, K.L. et al. (2018). Impact of patient reminders on papanicolaou test completion for high-risk patients identified by a clinical decision support system. *Journal of Women's Health, 27*(5), 569-574. doi: 10.1089/jwh.2017.6667

Mazor, K.M. et al. (2014). Health literacy and pap testing in insured women. *Journal of Cancer Education, 29*, 698-701. doi:10.1007/s13187-014-0629-7.

Medical College of Wisconsin Institute for Health and Equity & Wisconsin Electronic Disease Surveillance Systems (2021). *COVID-19 in Milwaukee County.* Retrieved from https://www.dhs.wisconsin.gov/covid-19/cases.htm#cumulative

Musa, J. et al. (2017). Effect of cervical cancer education and provider recommendation for screening on screening rates: A systematic review and metanalysis. *PLoS ONE, 12*(9). Retrieved from https://doi.org/10.1371/journal.pone.0183924

Nardi, C., Sandhu, P., Selix, N. (2016). Cervical cancer screening among minorities in the United States. *The Journal for Nurse Practitioners, 12*(10), 675-682. Retrieved from https://www.npjournal.org/article/S1555-4155(16)30501-3/pdf

National Cancer Institute. (2019). *National survey of primary care physicians' recommendations & practice for breast, cervical, colorectal & lung cancer screening.* Retrieved from https://healthcaredelivery.cancer.gov/screening_rp/

National Center for Health Statistics. (2011). *Health, United States, 2011: With special feature on socioeconomic status and health.* Retrieved from http://www.cdc.gov/nchs/data/hus/hus11.pdf

Nwankwo, C. et al. (2019). HSR19-102: Direct and indirect economic burden of cervical cancer in the United States in 2015: A mixed-methods analysis. *Journal of the National Comprehensive Cancer Network, 17*(3.5). Retrieved from https://jnccn.org/view/journals/jnccn/17/3.5/article-pHSR19-102.xml

Pampel, F.C., Krueger, P.M, Denney, J.T. (2010). Socioeconomic disparities in health behaviors. *Annual Review of Sociology, 36*, 349-370. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3169799/

Peabody, J.W. et al. (2004). Measuring the quality of physician practice by using clinical vignettes: A prospective validation study. *Annals of Internal Medicine, 141*(10), 771-780. Retrieved from https://pubmed.ncbi.nlm.nih.gov/15545677/

Rosenberg, J. (2019). Cervical cancer screening rates "unacceptably low," researchers find. *AJMC.* Retrieved from https://www.ajmc.com/newsroom/cervical-cancer-screening-rates-unacceptably-low-researchers-find

Sperl-Hillen, J.M. et al. (2019). Priorities wizard: Multiside web-based primary care clinical decision support improved chronic care outcomes with high use rates and high clinician satisfaction rates. *Journal for Electronic Health Data and Methods, 7*(1), 9. Retrieved from https://doi.org/10.5334/egems.284

Subramaniam, A. et al. (2011). Invasive cervical cancer and screening: what are the rates of unscreened and underscreened women in the modern era? *Journal of lower genital tract disease*, *15*(2), 110–113. Retrieved from https://doi.org/10.1097/LGT.0b013e3181f515a2

Teoh, D. et al. (2015). Adherence to the 2012 national cervical cancer screening guidelines: A pilot study. *American Journal of Obstetrics and Gynecology, 212*(1), 62. doi: 10.1016/j.ajog.2014.06.057

United States Zip Codes. (2020). *ZIP code 53212.* Retrieved from https://www.unitedstateszipcodes.org/53212/

U.S. Centers for Medicare & Medicaid Services. (2019). *National health expenditure data: Historical*. Retrieved from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical

White, P. & Kenton, K. (2013). Use of electronic medical record-based tools to improve compliance with cervical cancer screening guidelines: Effect of an educational intervention on physicians' practice patterns. *Journal of Lower Genital Tract Disease, 17*(2), 175-181. Retrieved from http://dx.doi.org.proxygw.wrlc.org/10.1097/LGT.0b013e3182607137

Wong, L.E. et al. (2020). *Where are all the patients? Addressing covid-19 fear to encourage sick patients to seek emergency care.* Retrieved from https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0193

World Health Organization. (2014). *Comprehensive cervical cancer control: A guide to essential practice* [2]. Geneva. https://www.ncbi.nlm.nih.gov/books/NBK269623/

APPENDICES

APPENDIX A

SWOT ANALYSIS

	Helpful To achieving the objective	**Harmful** To achieving the objective
Internal Origin {Attributes of the organization}	**Strengths** • New providers and medical assistants who are motivated to excel and eager to learn • Culture of teamwork and collaboration • Leadership has a clear vision of success and are committed to continuous growth of the organization • Clinical and administrative leaders prioritize interpersonal communication • Staff members are engaged in professional development • Experienced, diverse Registered Nurse staff • Increased appointment availability at clinic • Large clinic increases the opportunity for in-person meetings and educational sessions • Quality Improvement Representative and nursing research scientist for data analysis and management • Application support information technologist for data retrieval • Meaningful use of EMR • Safe Care Promise during COVID-19	**Weaknesses** • COVID-19 has led to the expansion of telehealth or virtual care and the redeployment of several primary care providers • Preventive exams requiring an in-person appointment such a cervical cancer screening are being deferred • The system of care lacks standardization • Lack of consistent processes staff use to outreach or educate patients to ensure periodic care based on level of risk • Recent provider turnover increases the risk that patients will be lost to follow-up • Busy practice lessens availability of leadership • Lack of communication strategy for cervical cancer control
External Origin {Attributes of the organization}	**Opportunities** • Meet or exceed the targeted (top decile) performance for Wisconsin Collaborative for Healthcare Quality (WCHQ) and Aurora cervical cancer screening goals. • Further reduce the morbidity and mortality associated with cervical cancer. • Improvement of service capacities • Enhance patient/provider education • Reduce costs for inappropriate examination. • Increased interest in advancing cervical cancer control activities. • HPV DNA-based testing has changed the landscape of cervical cancer screening and prevention.	**Threats** • Low socio-economic status group with subsequent large health disparities. • Relative underuse of primary care and overuse of hospital-based care. • Cultural and financial barriers to care. • Patient population with extensive active problem lists limits time spent addressing health maintenance topics.

APPENDIX B

EVIDENCE TABLE

Article Number	Author & Date	Evidence Type	Sample, Sample Size, Setting	Findings that Help Answer the EBP Question	Observable Measures	Limitations	Evidence Level, Quality
1	Boone, Lewis & Karp (2016)	Non-experimental cross-sectional survey	4,909 randomly selected primary care providers (physicians, nurse practitioners, and physician assistants) practicing in California	Among the primary care providers surveyed, distrust and confusion likely limit adherence to current evidence-based cervical cancer screening and health policy recommendations as well as contribute to high rates of over-screening.	Percentage of primary care providers (PCP) who do not believe current guidelines are clinically appropriate. Among PCPs who believe current guidelines are authoritative, reliable and clinically appropriate: Rate of screening intervals and methodology of testing consistent with that of current policy guidelines.	Survey as a research design increases risk of bias.	Level III Quality A
2	Brown, D. R. et al. (2011)	Qualitative Study	Federally qualified health center that provides health care services to low-income and uninsured individuals and families in Essex County, New Jersey. Six focus groups were conducted with 5 to 10 participants each, for a total of 44 women. One group was conducted with black women of Haitian descent (n = 8), while another included African immigrant women (n = 5). Two focus groups were held with black women from the English-speaking Caribbean (n = 12) and 2 additional groups were comprised of African American women (n = 19).	There was limited knowledge and confusion across ethnic groups about cervical cancer and its risk factors, the Pap test, and the human papilloma virus (HPV) and its association with cervical cancer. Barriers to cervical cancer screening included perceived cost, busy work schedule, fear of the unknown, lack of insurance or being unemployed. Culturally-based information about the importance of screening and knowing that screening helps to maintains one's personal health is a facilitator of cervical cancer screening. Having a doctor's recommendation was	Knowledge of cervical cancer and its risk factors, the Pap test, and the human papilloma virus (HPV) and its association with cervical cancer. Cervical cancer screening rates (practices). Facilitators for cervical cancer screening. Barriers to cervical cancer screening.	Limited generalizability because of the small, qualitative sample of primarily low-income black women.	Level III Quality B

				of paramount importance for screening across all groups. Recommend inclusion of women of all ages in cervical cancer education because of the roles they have in extended families.			
3	Feldman, Davie, & Kiran (2017)	Quality Improvement	Multi-site urban practice in Toronto, Canada. Focusing solely on cervical cancer screening, the baseline screening rates for cervical cancer was 60% among eligible women ages 21-69 years. Specific number of women included in the study was not reported.	Between March 2014 and December 2016, the cervical cancer screening rate increased from 60% to 71% ($p<0.05$). This increase occurred following implementation of (1) personalized recall letters for patients signed by their physician, (2) inclusion of educational brochures with the mailed letter, (3) physician audit and feedback, and (4) improved point-of-care reminders in the EMR.	Cancer screening rate in accordance with Ontario's cancer screening guidelines (the percentage of women age 21 to 69 who had a Pap smear within the last 3 years).	Multiple evidence-based strategies were implemented concurrently, thus limiting the ability to assess the contribution of each method in increasing cancer screening rates.	Level V Quality B
4	Ghare Naz et al (2018)	Systematic Review of interventional studies (RCT and quasi-experimental)	37 articles with 15,658 female participants in different parts of world were included in the review. 33.3% of studies were from Americas.	Educational interventions based on health behavior change theories could help to improve CCS behavior of women in different part of the world. Developing one's knowledge and beliefs lead to the change of health behavior. Theory-based education lead to increasing knowledge and promoting awareness and increasing screening rates. An educational intervention can help to reduce barriers of CCS and subsequently can help to increase CCS rate. Behavioral interventions	The effect of diverse educational interventions and health behavior change frameworks on cervical cancer screening behavior of women.	Study did not include 'grey' literature.	Level II Quality A

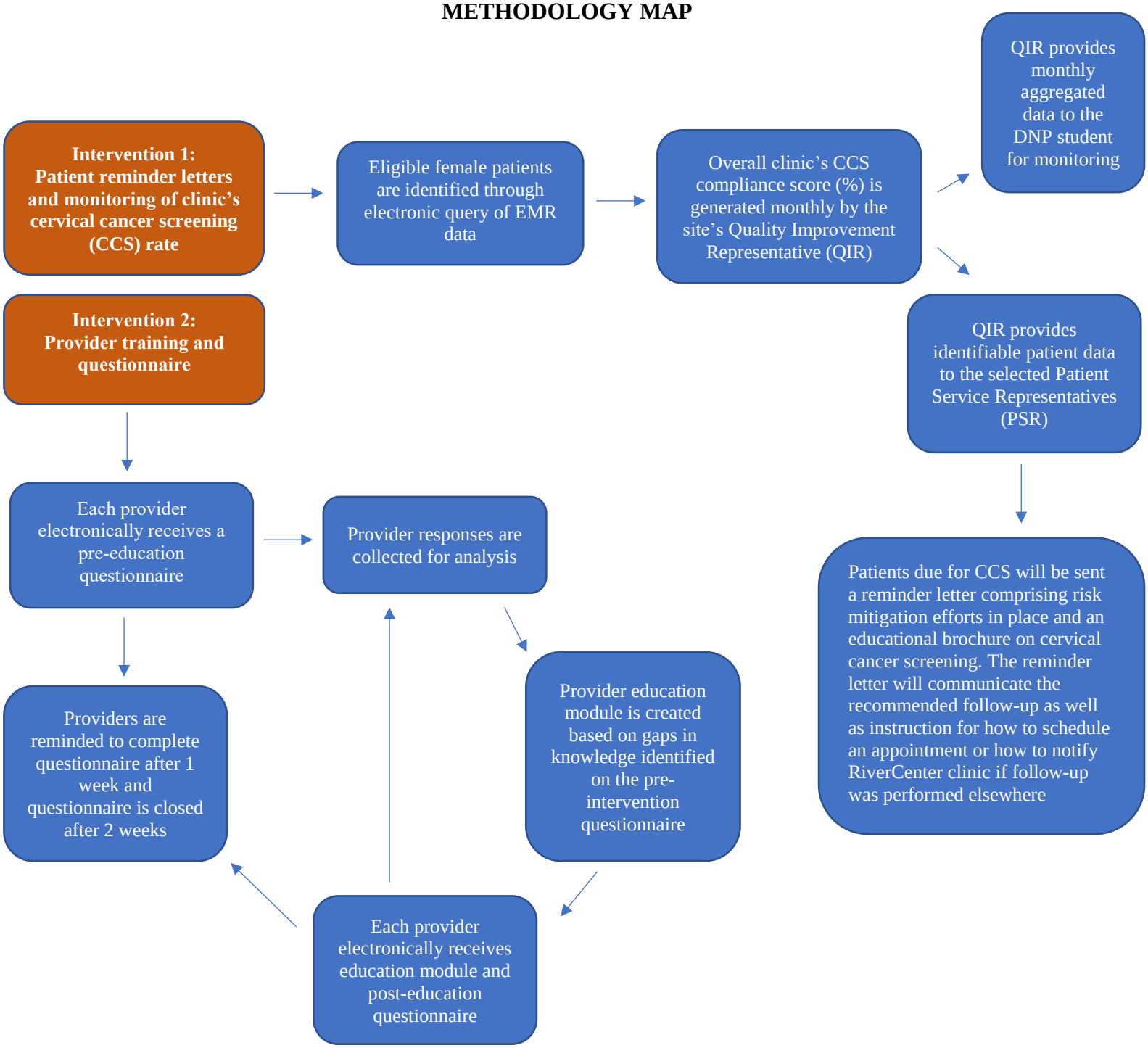
				example mailed or telephone reminders increased pap test usage by 18.8%			
5	Hills, R.L., Kulbok, P.A. & Clark, M. (2015).	Quality improvement project, which employed a descriptive comparison study design.	1,032 eligible female patients ages 21-64 years receiving care at The Fan Free Clinic in Richmond, Virginia and surrounding counties.	*Interventions:* (1) Implementation of a clinical decision support system, (2) provider educational outreach, (3) patient reminder letters, and (4) development of a clinic procedure manual. *Outcomes:* Patients screened according to guidelines nearly doubled. The number of under-screened patients was reduced by nearly half. There was a threefold decrease in patients screened more frequently than recommended.	Screened according to evidence-based guidelines. Not screened. Screened more frequently than recommended.	Multifaceted implementation strategies were treated as a unified strategy thereby precluding the relationship of outcomes to a specific intervention. Psychosocial barriers to screening were not analyzed.	Level V Quality A
6	MacLaughlin, K.L. et al. (2018)	Quasi-experimental study	25,500 high-risk women aged 18 through 65 years receiving care at 3 separate primary care sites affiliated with Mayo Clinic in Rochester, Minnesota.	A clinical decision support tool with capabilities to identify high-risk women due for cervical cancer testing beyond routine screening intervals, with subsequent patient notification, improved adherence to guidelines and appropriate follow-up. The average completion rate of recommended follow-up testing was significantly higher in the intervention group at 23.7% (61/257) than the completion rate at 3.3% (17/516) in the control group ($p < 0.001$).	Rate of test completion for high-risk patients who were overdue for screening or follow-up of abnormal Pap test, HPV test, or colposcopy results.	Homogeneous demographic characteristics of the patient population (primarily white, insured, and educated).	Level II Quality A
7	Mazor, K.M. (2014)	Randomized Controlled Trial	527 insured women ages 40 to 65 years in Georgia, Massachusetts, Hawaii, and Colorado	There is a statistically significant association between health literacy and	Reading and Listening Health literacy. Rate of adherence to evidence-based recommendations for Pap testing	Women in this study were all members of integrated healthcare delivery systems thereby limiting the ability to	Level I Quality A/B

			This study was conducted within the Cancer Research Network (CRN), a consortium of research organizations affiliated with non-profit integrated healthcare delivery systems, funded by the National Cancer Institute. 45 % (n=241) of the women in this study had at least a bachelor's degree. 42% (n=222) reported their race as white, non-Hispanic. Percent reporting membership in other racial or ethnic categories were as follows: 18 % African–American (n=92); 14 % Asian or Pacific Islander (n=74); 18 % Hispanic (n=97); and 7 % other or multiple categories (n = 36) identified.	cervical cancer screening. Women with higher health literacy were more likely to have had a recent Pap test. Spoken health literacy was associated with screening behaviors in this population, suggesting that it has independent effects beyond those of access to care. Health educators and clinicians should be aware that women may have difficulty understanding spoken recommendations about cancer screening.		generalize these findings to women in other systems. Generalizability may also be limited by the fact that women in this study were volunteers. These women may differ in statistically meaningful ways from women who did not participate.	
8	Musa, J. et al. (2017)	Systematic Review & Metanalysis	5 studies (RCT) involving a total of 797 women who were exposed to cervical cancer education and 812 women in the comparison group.	Use of culturally sensitive educational materials, letters with fact sheets on cervical cancer and screening, cervical cancer screening brochures and invitation letters had a significant effect on improving patient participation and cervical cancer screening rates.	The proportion of eligible women exposed to the intervention or control who completed cervical cancer screening during the trial.	Failed to collect secondary outcome data on the cost of cervical cancer screening tests, health insurance coverage and how these variables contributed to the screening rates in women of various socio-economic status, age, and geographic settings.	Level II Quality A
9	Teoh, D. et al. (2015)	Non-experimental cross-sectional survey	124 providers (physicians, nurse practitioners, physician assistants, and certified nurse midwives) in a large health maintenance organization in Minnesota.	Adherence to the 2012 cervical cancer screening guidelines is poor due, in part, to a lack of provider knowledge of the guidelines.	Knowledge of the 2012 screening guidelines as demonstrated by a correct response to 6 questions that ask the provider to identify the screening recommendation for each patient scenario.	Small sample size limited the ability to conduct subgroup analyses. There is no information on non-responders, who may have lower guideline adherence rates.	Level III Quality A

					Percentage of provider screening practices in accordance with 2012 guidelines determined by answers to 15 questions re: how providers are screening patients (Pap smear alone vs cotesting) and the frequency at which they are performing each screening modality. Provider views of their practice in relation to the guidelines, including how often they adhere to the guidelines and reasons for not adhering to guidelines in each age group.	Study used a self-reported survey design to collect data on knowledge of the guidelines. It is possible that respondents were answering the practice questions based on their knowledge of the guidelines rather than based on a reflection of their true practice.	
10	White & Kenton (2013)	Retrospective Review	374 females <21 years of age at Loyola University Medical Center	Three EMR-based tools were implemented to educate providers on cervical cancer screening guidelines. *Following implementation:* The total number of Pap tests done on adolescents decreased by 34%. There was a decrease in the proportion of co-tests ordered by primary care physicians. Appropriate follow-up for abnormal results improved 8%.	Providers' compliance with guidelines for cervical cancer screening in patients less than 21 years of age. Proportion of co-tests ordered by primary care physicians. Appropriate follow-up for abnormal results.	The overall numbers of abnormal results were very low, making it difficult to determine whether any improvements in management truly related to the implemented EMR changes. Because this was a retrospective review of all screened adolescents during a single calendar year rather than following a group of specific physicians' practice patterns over a period, study is unable to control for changes in faculty and resident staff.	Level III

APPENDIX C

METHODOLOGY MAP



APPENDIX D

PATIENT REMINDER LETTER

Our records show that it is time for you to get a Pap test to protect you from cervical cancer. Please schedule an in-clinic appointment with your primary care by choosing one of the following methods:

1. Call the clinic at 414-283-844.
2. Log into the LiveWell app and select the *appointments* icon from the activities page then select *schedule an appointment.*
3. Go to https://myadvocateaurora.org and log in with your username and password. Select *visits* then select *schedule an appointment.*

If you have received a Pap test at another facility within the last 3-5 years, please contact RiverCenter clinic to find out the necessary steps to have this information forwarded to our clinic: 414-283-8444.

RiverCenter clinic is cautiously beginning to reactivate services while also managing the evolving COVID-19 pandemic. We are dedicated to providing preventive healthcare, such as cervical cancer screening with Pap testing. As we resume routine in-person appointments, please be assured that your safety remains our highest priority. Enhanced procedures and protocols are in place so that you can receive in-person care as safely and effectively as possible.

The **Advocate Aurora Safe Care Promise** is designed to build consumer confidence, encourage patients to seek care they need and support our team members. Everyone will go through a COVID-19 screening before entering our clinic. Anyone who enters our clinic wears a mask. If you do not have a mask, we will gladly provide it. Our rearranged waiting areas and staggered appointment times reduce traffic and create safe spaces. We have increased cleaning in all areas, including additional disinfectant for high-touch spaces. Our visitor policy has also been updated to include one support person for adult patients who require complex medical decision-making. For those with symptoms, we kindly ask that you stay home and reschedule your Pap smear.

If you think you've been exposed to COVID-19 or are experiencing fever, cough or shortness of breath, start with our COVID-19 Symptom Checker or call 866-443-2584.

Symptom Checker and COVID-19 Resource Center can be accessed at:
https://www.advocateauroraheath.org/coronavirus-disease-2019/

Did you know?

Cervical Cancer tests and HPV vaccines are covered by most health plans with no cost to you – call the number on your insurance card to check.

If you need help finding a doctor, go to **aurora.org/findadoctor** or call **888-863-5502.**

Aurora Health Care is working together with your health plan. If you have any questions or comments, please call 866-225-9528.

Aurora Health Care®

We are AdvocateAuroraHealth

aurora.org

x20190058a (02/19) ©AHC

Life is an adventure. Stay healthy and enjoy it.

Aurora Health Care®

We are AdvocateAuroraHealth

Cervical cancer can be treated and cured when caught early.

Almost all cervical cancers are caused by the human papillomavirus (HPV). HPV is a common virus passed from person to person during sexual activity. A person infected with HPV may not know they have it.

GETTING TESTED IS ONE OF THE BEST THINGS YOU CAN DO TO PREVENT CERVICAL CANCER.

Early on, you may not know you have cancer—that's why it is so important to get tested.

Make sure you get regular pap screenings

Preventing cervical cancer is as easy as 1-2-3:

1

Make an appointment with your doctor or clinic.

If you need help finding a doctor, go to aurora.org/findadoctor or call **888-863-5502.**

2

Get your Pap test.

Women should have their first Pap beginning at age 21.

If your Pap test is normal, you may not need another Pap test for three years.

If your Pap test is not normal, be sure to follow up with your doctor.

A Pap test can find abnormal cells or cancer early when treatment works best.

3

Get your HPV vaccine (called Gardasil) if you haven't already.

A series of 2 or 3 HPV vaccines may be recommended depending on your age.

HPV vaccines are safe and can prevent infection with the viruses that cause cervical cancer.

If you haven't gotten the vaccine and have any questions, talk with your doctor.

APPENDIX E

PROVIDER QUESTIONNAIRE

Cervical Cancer Screening Questionnaire

The following survey was adopted and modified from the *National Survey of Primary Care Physicians' Cancer Screening Recommendations and Practices*, sponsored by the National Cancer Institute (NCI) in collaboration with the Agency for Healthcare Research and Quality (AHRQ) and Centers for Disease Control and Prevention. All information you provide in this survey will remain confidential. Your answers will be aggregated with those of other respondents. Participation is voluntary and there are no penalties to you for not responding.

Survey instructions: Questionnaire contains Likert scale, multiple choice and two-group categorical data. Please select the corresponding answer(s) that best fit your current clinical practice. Assume all patients are otherwise healthy individuals with no history of immunocompromise or increased risk unless specified in the scenario.

1. How effective do you believe the following screening procedures are in reducing cancer mortality in average-risk women?

Very Effective Somewhat Effective Not Effective Not Sure

a. Pap test (conventional cytology)

b. Pap test (liquid-based cytology)

c. HPV DNA test with Pap test

2. In your clinical practice how influential are cervical cancer screening guidelines from the following organizations?

Very Influential Somewhat Influential Not Influential Not Familiar

a. U.S. Preventive Services Task Force

b. American Cancer Society

c. American College of Obstetricians & Gynecologists

d. American Academy of Family Physicians

e. American College of Physicians

3. During a typical month, for how many asymptomatic, average-risk female patients do you personally order or perform cervical cancer screening with Pap testing?

- ○ 0
- ○ 1-10
- ○ 11-20
- ○ 21-30
- ○ 31-40
- ○ More than 40

4. Do you order or perform Pap testing, or work with a Nurse Practitioner (NP) or Physician's Assistant (PA) who orders or performs Pap testing for your female patients? Select all that apply.

- I personally order Pap testing
- I personally perform Pap testing
- I work with an NP or PA who orders or performs Pap testing for my patients

5. Which cytology method do you use most often for cervical cancer screening?

- Liquid-based – specimen suspended in liquid solution (e.g., Thin Prep or SurePath)
- Conventional cytology – smear spread on glass slide and fixed
- Other

6. Do you ever recommend Human Papilloma Virus (HPV) testing for your female patients? Select all that apply.

- Yes, I recommend HPV testing with the Pap test for routine cervical cancer screening
- Yes, I recommend HPV testing as a follow up test for an abnormal Pap test
- No, I do not recommend HPV testing at all

7. Assume that the following female patients present for a routine visit in your office. What would you be most likely to recommend for Pap testing at this visit?

Answer choices for each of the following questions:

- Pap annually
- Pap every 3 years
- Pap every 5 years
- Pap + HPV testing annually
- Pap + HPV testing every 3 years
- Pap + HPV testing every 5 years
- No Pap

a. 18 year-old who has never had sexual intercourse and is presenting for her 1st gynecologic visit

b. 18 year-old who had sexual intercourse for the first time 1 month ago and is presenting for her 1st gynecologic visit

c. 18 year-old who first had sexual intercourse 3 years ago and is presenting for her 1st gynecologic visit

d. 25 year-old who has had no new sexual partners in the last 5 years and 3 consecutive negative Pap tests

e. 35 year-old who has had no new sexual partners in the last 5 years and 3 consecutive negative Pap tests

f. 35 year-old whose cervix was removed last year during hysterectomy for symptomatic fibroids. Has no history of cervical, vaginal or vulvar dysplasia, and 3 consecutive negative Pap tests

g. Healthy 66 year-old who has had no new sexual partners in the last 5 years and 3 consecutive negative Pap tests. Last Pap with HPV co-test was performed 3 years ago, which resulted negative

8. How often do you recommend Pap and HPV testing for the following 35 year-old female patients? The first number reflects the frequency of Pap testing (in years) and the second number reflects the frequency of HPV testing (in years). "0" indicates that you would not perform the test as part of screening or follow up.

	5, 0	5,5	3,0	3,3	1,0	1,1
a. HPV and Pap cytology this year were negative						
b. HPV is positive and Pap cytology is negative						
c. HPV is negative and Pap cytology shows ASC-US						

9. Indicate your level of agreement with the following statements.

	Strongly Agree	Somewhat Agree	Somewhat disagree	Strongly Disagree
a. HPV DNA testing with Pap testing is more accurate than Pap alone in predicting cervical cancer				
b. HPV vaccine will impact when I start cervical cancer screening among females who have been fully vaccinated with the HPV vaccine				
c. HPV vaccine will impact how often I screen for cervical cancer among females who have been fully vaccinated with the HPV vaccine				

10. There are several types of practice settings in which cervical cancer screening and follow up can be handled. For the female patients below who are HPV positive and recently had a Pap test showing ASC-US, please indicate what you would typically do.

	Manage in my own practice	Refer to gynecology
a. Premenopausal, < 30 years old		
b. Premenopausal, >+ 30 years old		
c. Postmenopausal		

11. A 24-year old (with no prior abnormal result) has a Pap result showing LSIL. What is the recommended follow up?

- Colposcopy
- Repeat Pap in 12 months
- Screening with co-testing in 3 years
- Screening with Pap testing in 3 years

12. A 40 year-old (with no prior abnormal result) has normal Pap cytology with positive HPV. What is the recommended follow up?

- Repeat co-testing in 3 years
- Colposcopy
- Repeat co-testing in 12 months
- Screening with co-testing in 5 years

13. When should a Pap test be repeated if initial cytology returned unsatisfactory?

- 10-12 months
- 6-8 months
- 1-2 weeks
- 2-4 months

14. A 24 year-old underwent colposcopy for HSIL, which revealed absence of CIN 2/3. What is the recommended follow up?

- Repeat colposcopy and cytology every 6 months for 2 years
- Repeat colposcopy and cytology every 12 months for 2 years
- Repeat co-testing in 12 months
- Repeat co-testing in 6 months

15. A 34 year-old (with no prior abnormal result) undergoes Pap with HPV co-testing. Her result shows ASC-US and HPV positive. What is the recommended follow up?

- Colposcopy
- Repeat co-testing in 3 years
- Repeat co-testing in 12 months
- Continue routine screening with co-testing in 5 years

16. LSIL Pap result at age 24 requires a repeat Pap test in 12 months, while LSIL Pap result at age 25 requires colposcopy.

- True
- False

17. Select all that apply. Women ages 65+ should stop screening when:

- 3 consecutive negative cytology tests
- 2 consecutive negative co-tests/HPV tests within the past 10 years
- 1 negative co-test/HPV test in the past 5 years regardless of prior Pap history

18. A 45 year-old underwent a complete hysterectomy for cervical dysplasia. Screening should be continued with a vaginal swab.

- True
- False

19. A 20 year-old woman should undergo cervical cancer screening if this individual is sexually active and has a history of HIV.

- True
- False

20. Pap with HPV co-test was performed on a 30 year-old with history of rheumatoid arthritis on immunosuppressant treatment. Result of cytology is normal and HPV is negative. How often should co-testing be performed on this individual?

- Annually until 3 consecutive results are normal
- Every 3 years
- Every 5 years

The following question is present on the post-education questionnaire only:

21. Indicate your level of agreement with the following statements

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
a. My knowledge of cervical cancer screening and management of abnormal Pap results improved by reviewing the education offered				
b. My practice patterns will change as a result of reviewing the education offered				

APPENDIX F

DATA COLLECTION/EVALUATION AND ANALYSIS METHODS TABLE

Aims/ Evaluation	**Measures**	**Measure Type**	**Data Source**	**Recruitment method/ Population**	**Timing/ Frequency**	**Calculation/ Statistics**	**Goal/ Benchmark**
Increase RiverCenter clinic's cervical cancer screening rates. *Does the use of patient reminder letters comprising written education and risk-mitigation efforts improve cervical cancer screening rates during reopening of a large metro family practice clinic in the wake of COVID-19?*	% of eligible female patients that have received Pap testing with either cytology alone or co-testing with HPV in accordance with USPSTF guideline recommendations (the actual number of cervical cancer pap tests performed divided by the total number of eligible patients). % of patient reminder letters sent to eligible patients Number of patients who received a reminder letter that completed cervical cancer screening with Pap.	Outcome	EMR chart review	All eligible female patients as of August 2020 who have been identified as due for cervical cancer screening by the site's QI representative	Monthly, spanning from August to December 2020	Percentage/ Proportion	Meet or exceed Healthy People 2020's target goal of screening 93% of eligible female patients for cervical cancer. 100% of reminder letters will be sent to eligible patients (295 letters total)
Improve providers' knowledge of cervical cancer screening guidelines and appropriate follow-up for abnormal Pap testing. *Does provider training enhance providers' knowledge of appropriate follow-up for abnormal Pap testing?*	% of questions answered correctly on the modified National Survey of Primary Care Physicians' Cancer Screening Recommendations & Practice questionnaire. Number of questions correct divided by total number of questions. Percentage will be calculated from the following questions: 7a-7g, 8a-8c, 11-20.	Outcome	Providers' answers on the modified National Survey of Primary Care Physicians' Cancer Screening Recommendations & Practice questionnaire	Providers were invited to participate in provider training including completion of pre- and post-training questionnaire (voluntary). Participants work at least a 0.5 full-time equivalent (FTE) as a primary care provider at RiverCenter clinic: 2	Pre- and post-test	Percentage/ Proportion Wilcoxon signed-rank test will be used to compare two sets of scores that originate from the same provider participants.	10% improvement in post-training questionnaire score

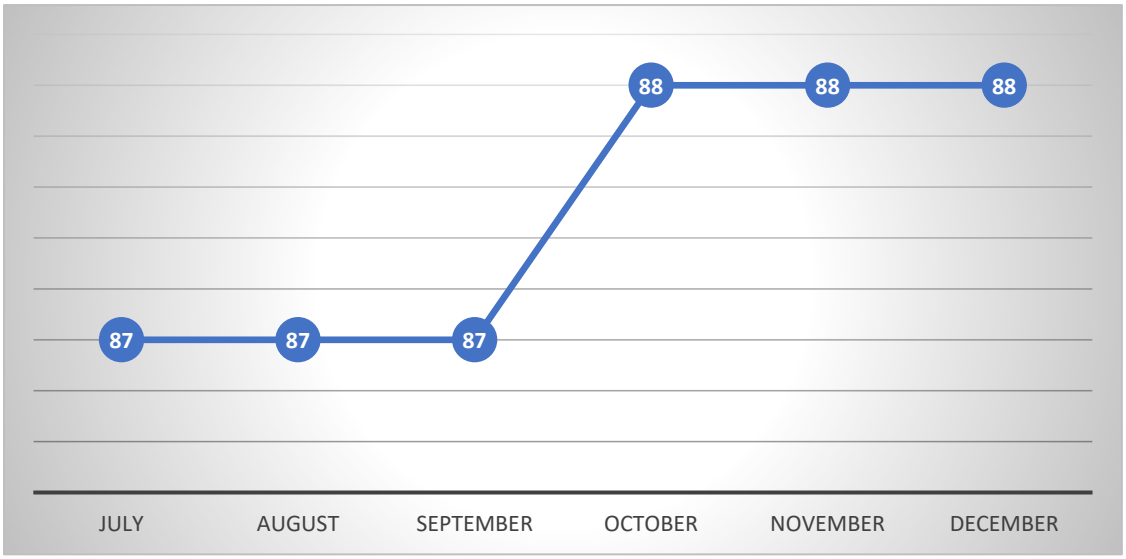
				female nurse practitioners, 2 female physician assistants, 4 female physicians and 2 male physicians			

APPENDIX G

FIGURES AND TABLES

Figure 1

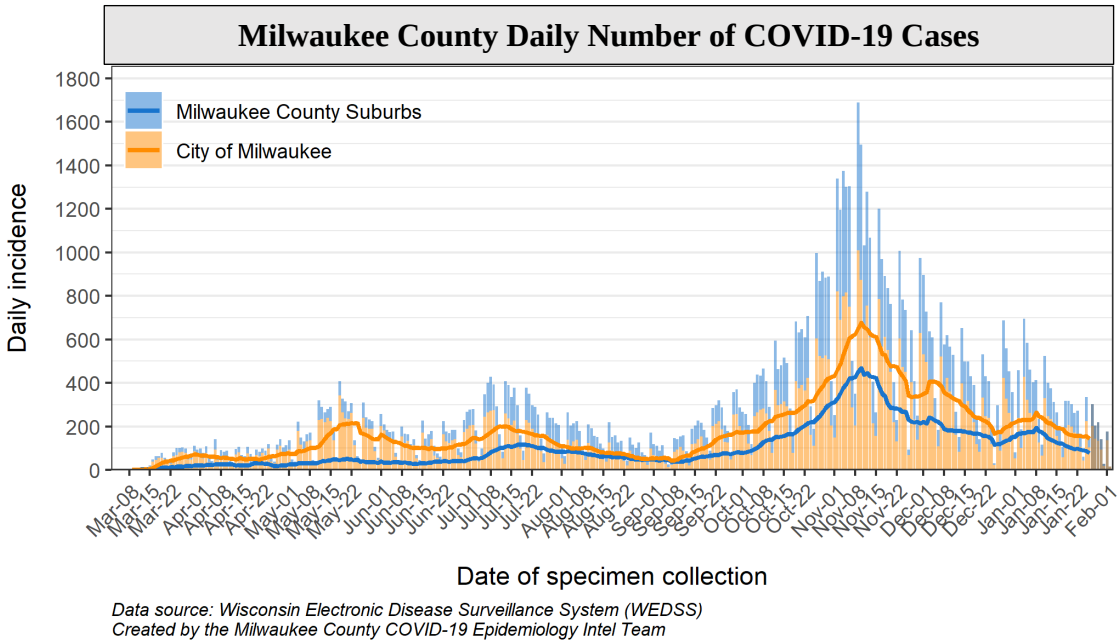
Aggregated Cervical Cancer Screening Score for RiverCenter Clinic (%)



Note. The overall clinic's cervical cancer screening rates (expressed in percentage) are shown from July 2020 to December 2020 with a 1% increase noted in October 2020 and maintained through December 2020

Figure 2

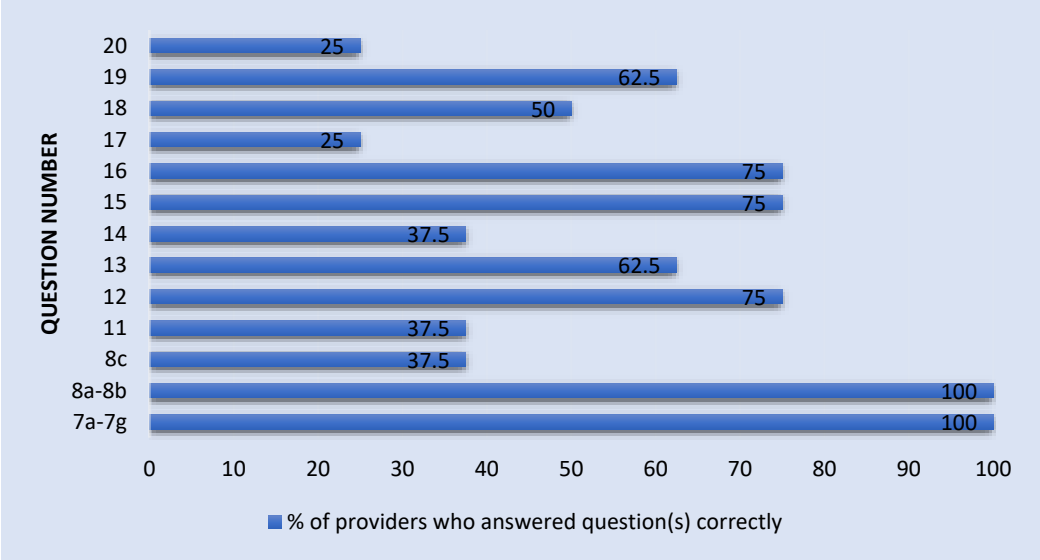
COVID-19 in Milwaukee County: Daily Incidence of New Cases (Bars) and Average Daily Incidence (Line) Within the Last 7 Days



Note. At the time of data collection, a total of 9,4609 COVID-19 cases in Milwaukee County had been identified since the first confirmed case on 03/06/20. The highest daily case count since the beginning of the pandemic occurred on 11/09/20 with 1,689 cases in Milwaukee County overall.

Figure 3

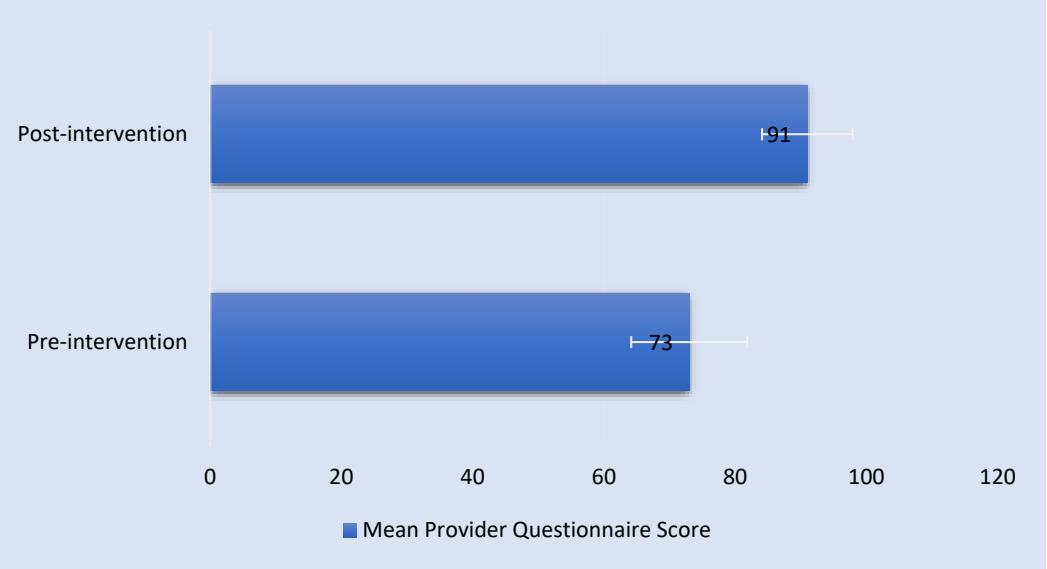
Percent of Correct Answers on Pre-education Provider Questionnaire



Note. Questions regarding frequency of routine cervical cancer screening based solely on age were answered correctly by 100% of providers. Less than 40% of the providers answered questions 8c, 11, 14, 17, and 20 correctly. These questions examined appropriate follow-up for women over 30 years of age with ASC-US, younger than 25 years of age with LSIL or higher, and screening guidelines for those who are immunocompromised as well as for women ages 65+.

Figure 4

Comparison of Mean Provider Score (%) on Pre- Vs. Post-education Questionnaire



Note. Eight out of ten providers completed the pre-education questionnaire with a mean score of 73.12%, standard deviation of 8.84. Seven out of ten providers completed the post-education questionnaire with a mean score of 91.43%, standard deviation of 6.90. The post-education questionnaire score increased by 18% from baseline.

Figure 5

Percent of Correct Answers on Post-education Provider Questionnaire

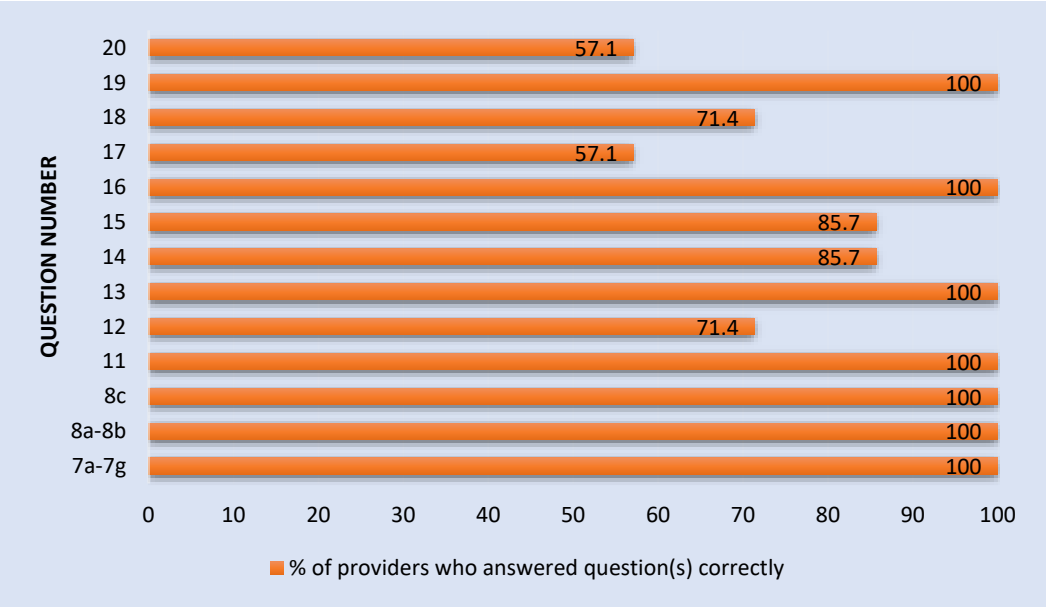
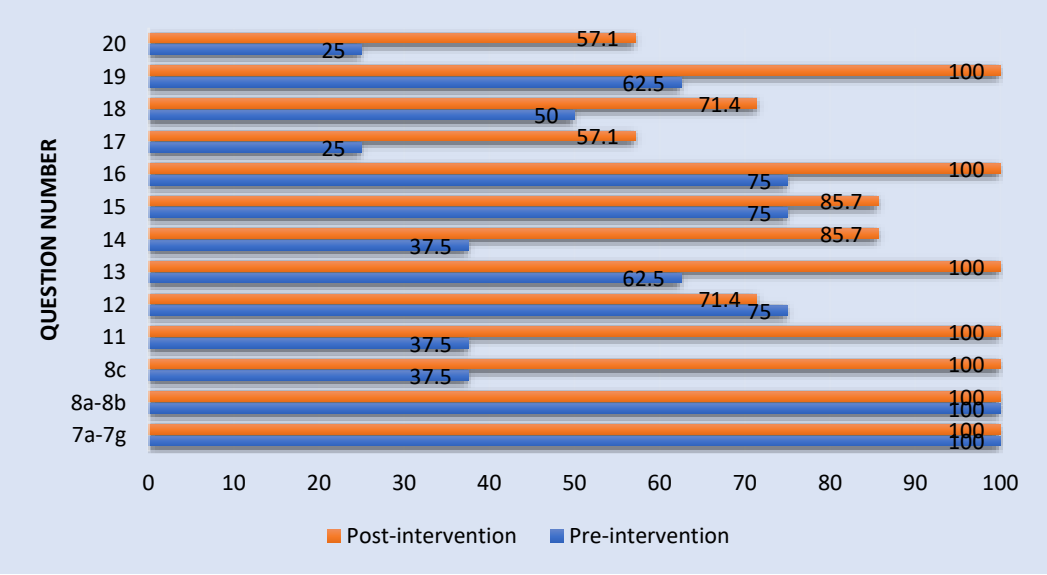


Figure 6

Comparing Percent of Correct Answers on Pre- Vs. Post-education Provider Questionnaire



Note. An increase was noted in the percent of providers who answered each question or group of questions correctly following the educational intervention. There was 1 question (#12) out of 20 questions total in which a decrease was found in the percent of providers who answered correctly; however, this finding was attributable to a decrease in the number of providers who completed the post-education questionnaire.

Table 1

Perceived Efficacy of Various Screening Procedures

How effective do you believe the following screening procedures are in reducing cancer mortality in average-risk women?				
Procedure	**Very Effective**	**Somewhat Effective**	**Not Effective**	**Not Sure**
Pap test (conventional cytology)	25%	50%	0%	25%
Pap test (liquid-based cytology)	62.5%	25%	0%	12.5%
HPV DNA test with Pap test	100%	0%	0%	0%

Table 2

Perceived Influence of Various Screening Guidelines

In your clinical practice how influential are cervical cancer screening guidelines from the following organizations?				
Guideline	**Very Influential**	**Somewhat Influential**	**Not Influential**	**Not Applicable or Not Familiar**
U.S. Preventive Services Task Force	75%	12.5%	0%	12.5%
American Cancer Society	12.5%	50%	0%	37.5%
American College of Obstetricians & Gynecologists	62.5%	25%	0%	12.5%
American Academy of Family Physicians	12.5%	75%	0%	12.5%
American College of Physicians	0%	50%	12.5%	37.5%

Table 3

Perceived Accuracy of HPV DNA testing and the Impact of HPV Vaccination on Screening

Indicate your level of agreement with the following statements.				
Guideline	**Strongly Agree**	**Somewhat Agree**	**Somewhat Disagree**	**Strongly Disagree**
HPV DNA testing with Pap testing is more accurate than the Pap test alone in predicting cervical cancer	87.5%	12.5%	0%	0%
The HPV vaccine will impact when I start cervical cancer screening among females who have been fully vaccinated with the HPV vaccine	0%	12.5%	0%	87.5%
The HPV vaccine will impact how often I screen for cervical cancer among females who have been fully vaccinated with the HPV vaccine	0%	0%	0%	100%