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Managing Patients at High-risk for Breast Cancer: An eLearning Module for Primary Care Providers

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Managing Patients at High-risk for Breast Cancer: An eLearning Module for Primary Care

Providers

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Abstract

Background: Women at high-risk of developing breast cancer must be screened appropriately and educated about breast cancer reduction strategies much earlier than those of average risk. The National Comprehensive Cancer Network (NCCN) (2017) has identified guidelines for the care of this group. While some primary care providers (PCPs) are well informed about high-risk and how to identify it, many are not. This project focuses on the development of education for providers, specifically an eLearning module, to help translate guidelines into practice.

Methods: Providers of adult primary care (including internal medicine and family practice) from four clinics in Snohomish County, Washington, were asked to participate in an eLearning module regarding the care of patients at high-risk for breast cancer. The module was developed using the Microsoft Mix platform and a link was sent out to primary care providers via email during a thirty-day period. Data was collected and analyzed using the Kirkpatrick Method to evaluate the objectives related to reaction, learning, behavior and results through a pretest survey and two posttests surveys (one immediately following the module and another approximately thirty days following the opening of the module) to determine if the objectives were achieved.

Results: Repeated measures surveys using a Likert Scale were presented to the PCP participants, as well as questions regarding demographics and current practices. The surveys assessed the four components of learning according to the Kirkpatrick Model including *reaction, knowledge, behavior* and *results*. Twenty-three providers (22.3%) responded and reacted positively to this learning format. All participants reacted favorably to questions regarding *reaction*, with greater than 50% answering "strongly agree" or "agree". Paired *t*-tests were used to evaluate learning regarding *knowledge* and *behavior*, showing statistically significant improvement (sig. < 0.05) between pretest and posttest for questions about understanding current evidence-based

recommendations, use of a screening tool, and referrals to a breast care specialist, supporting

that learning occurred and participants believed this learning would impact their behaviors.

Results after one month were weak, with participation in the follow-up survey to be ten

providers, however 60% were inclined to provide a more individualized approach to high-risk

assessments, and 80% were more aware of the specialized care available to reduce the burden of

high-risk care from their practices. The use of a screening tool, as well as collaboration with

experts, were two categories that remained neutral or showed little positive impact, however to

truly evaluate these practices, a longer study would be beneficial.

Implications for practice: High-risk breast education is needed for the PCP to engage in shared

decision-making with their patients about high risk care.

Conclusions: Patients at high-risk for developing breast cancer should be evaluated more

frequently to prevent cancer. The USPSTF does not set guidelines for mammography of patients

who are at high-risk. The NCCN (2016) has created evidence-based guidelines for the support

and monitoring of patients who are found to be at high-risk; however, this evidence continues to

be slowly disseminated.

        Keywords: High-risk, breast cancer, provider education, education module, internet-
  based learning

Managing Patients at High-risk for Breast Cancer: A Learning Module for Primary Care

Providers

Introduction

When making recommendations to patients about when they should be receiving their

annual mammograms, it is often confusing for providers because various bodies of knowledge

continue to disagree. For women of average risk, The American Cancer Society (ACS), The

American College of Radiology (ACR), The American College of Gynecology (ACOG) and The

United States Preventative Services Task Force (USPSTF) do not agree on the starting age and

frequency women should receive mammograms. A majority of providers across the nation

choose to follow the USPSTF recommendation who state that women should receive

mammograms every two years after age 50-years until the age of 74-years (USPSTF, 2016).

This recommendation differs from those of the ACS (2017) who recommend yearly

mammography starting at age 45-years, and the ACR (2017) and ACOG (2017) who recommend

yearly mammography starting at age 40-years. In the midst of confusion about what is the best

recommendation to follow for mammography, more recent evidence based recommendations

regarding identification and management of patients at higher risk have not been uniformly

translated into primary care. This project focuses on educating primary care providers (PCPs)

about recommendations for patients at high-risk for developing breast cancer, so that they can

better educate their patients and facilitate shared decision-making about appropriate preventative

care.

Background

Evidence indicates that persons of higher risk must be screened appropriately and

educated about breast cancer risk reduction strategies earlier than persons at average risk. The

high-risk category includes persons who have a strong familial history of breast and ovarian

cancer, women with dense breast tissue, and those with genetic predisposition (Raikhlin et al.,

2015). It is estimated that 86% of women over twenty years of age who have the BRCA1 and/ or

BRCA2 gene mutations are unaware (Drohan, Roche, Cusack, & Hughes, 2012). Additionally,

in recent years, several new genetic mutations linked to breast cancer have been identified. The

guidelines created by the National Comprehensive Cancer Network (NCCN) (2017) for women

at high-risk are more rigorous and include increased screening every six months alternating both

mammography and magnetic resonance imaging (MRI), biannual breast examination by a breast

care provider, and, where appropriate, genetic testing. The consensus is that use of magnetic

resonance imaging (MRI) is the most sensitive imaging modality in identifying cancer in earlier

stages, when compared to using mammography alone (Berg et al., 2012).

Furthermore, breast density is quickly becoming a recognized risk factor for breast

cancer, however women generally do not know whether they have dense breast tissue until their

first mammogram. Thirty states have enacted laws requiring that breast density information be

given to the patient following mammography (Vroomen, 2017), however Washington State is

currently in process to do so. The ACR (2014) supports that increased breast density may

interfere with the detection of breast cancer and that is likely increases the risk of breast cancer,

although breast tomosynthesis (3D imaging) mammography is improving the imaging of dense

tissue.

The NCCN (2017) guidelines are specific regarding the care of women with a greater

than 20% lifetime risk, which often includes women under the age of 40-years. Unfortunately, at

this time, these guidelines have not been translated into primary care practice very well. While

some primary care providers are very well informed about what qualifies a patient as high-risk,

others remain unsure. Even when they are able to identify risk, they do not know how to manage or where to send these patients for further evaluation because high-risk breast programs are just beginning to emerge into mainstream health care.

The evidence-based guidelines that are in place to provide specialized care for these patients, however guidelines have not yet been well integrated into practice. Providers need to be aware of what can be done to deliver optimal preventative care, or at the very least, how to appropriately screen and refer those most at risk. While high-risk breast programs are an emerging preventative service that may not be available in all areas, educating PCPs about these guidelines will better prepare them to assess risk and share in further decision making with their patients for the future (Cadiz et al., 2013).

Problem Statement

Risk of undiagnosed breast cancer among women and men between the ages of 30-50 years who have a greater than average risk for breast cancer, is indicated by breast cancer diagnoses among this population and partially-results from a delay in screening due to lack of provider knowledge about the need for early screening. The goal of this project was to create, distribute and evaluate a relevant eLearning module that educates the primary care provider regarding specialized care of the high-risk population, and to affect a behavior change among PCPs to recognize their role in the preventative care of high-risk patients.

Gap Analysis

This project focused on one community, Snohomish County, in Western Washington, approximately 20 miles north of Seattle. One diagnostic breast center located in Everett, Washington, and serves patients in this community from two main medical groups, Providence Medical Group and The Everett Clinic, as well as two small practices, Seamar Medical Group

and Community Health Centers. The breast center completes about 12,000 screening

mammograms per year, and 12-15,000 diagnostic exams and procedures for patients including

those referred in from other screening sites in the community. The breast center also employs

advanced practice nurses who are trained in providing evidence-based care for patients at high-

risk for breast cancer. In 2014, the high-risk breast program launched, but referrals where less

than 100 patients the first year, although they have steadily increasing over time. In the first eight

months of 2017, nearly 500 patients had been seen in the high-risk program. Approximately

20% of these patients were referred by their PCP or obstetrician/ gynecologist who had previous

knowledge of the program and the service it provides, while the other 80% were identified as

potentially high-risk by the breast center staff during routine mammograms.

     Many of the patients referred to the high-risk program are identified at the breast center

as potentially high-risk at the time of a routine mammogram. Their brief health history is

obtained and evaluated by the technologists and radiologists who perform and read the imaging

exams mammograms. The patient information is entered into the computerized mammography

system which estimates a lifetime risk factor using the Tyrer-Cuzick and NCI lifetime risk

models. Once the risk has been calculated, the primary care providers are notified of the findings

in the mammography report. For those patients estimated to have a lifetime risk greater than

20%, recommendations are made (in the mammography report), by the radiologist to the PCP, to

refer the patient for a comprehensive risk assessment with the high-risk program providers. The

onus of this referral is placed back with the PCP to generate, as well as to share in the decision-

making with the patient about pursuing this care, as the radiologists do not manage on-going

patient care. The problem continues to be that many PCPs do not look for the recommendations,

nor do they have knowledge regarding high-risk and what a high-risk program offers in

managing breast cancer prevention.

Review of the Literature

A search for literature related to the education of primary care providers about high-risk breast programs was conducted using the search engines CINAHL, PUBMED, The Cochrane Database and OVID. Terms including "high-risk", "breast cancer", "internet-based learning", "primary care providers", "health care providers", "continuing education", "eLearning" and "modules" were used. Articles were considered if they were peer reviewed and published between 2007 and present. The initial combined search for articles found 174 articles. Articles were used as supporting evidence for this project if they identified high-risk breast programs as a resource for patients and providers, as well as those identifying a need for more of this knowledge in our community. Articles were also included regarding the discussion of internet-based learning among health care professionals, including the development and evaluation of this type of learning. Literature was excluded if the article could not be easily retrieved related to cost or availability, was not peer-reviewed, did not include research pertaining to the holistic care of high-risk patients and/or programs (i.e. articles specific to cancer care or genetics only), or those that did not address the provider's learning experience with at least part of the experience using an electronic format.

Most of the information around high-risk breast care focused on the best imaging modalities for the detection of breast cancer, genetic involvement in breast cancer, and cancer care. Although these topics are central themes in the care of high-risk patients, only six articles identified high-risk programs and the need for specialty care for high-risk patients. Evidence was found to support the idea that patients at high-risk benefit from a program that includes a comprehensive risk assessment, annual mammography and magnetic resonance imaging (MRI),

yearly office visits and clinical breast exam with a qualified provider, and genetic testing (if

indicated) (Cadiz et al., 2013). Lifestyle modification education-including (but not limited to)

diet/ exercise programs, stress-reduction methods, and smoking cessation plans-is also an

important component of a high-risk program (Afonso, 2009).

The benefit of high-risk programs does not appear to be widespread among primary care

providers because literature supported that it was only after a cancer diagnosis was made that the

patients were found to have genetic mutations and/or strong family histories of breast cancer,

indicating provider education about identifying high-risk patients is currently subpar (Vanstone

et al., 2012). The USPSTF (2013) established guidelines for the primary care provider to

appropriately screen and refer patients found to have a family history of breast, ovarian, tubal

and peritoneal cancers for high-risk counselling; however, Quillin et al. (2013) found that only

one in 22 patients who had such family histories was appropriately screened and referred by their

PCP. Another study identified that primary care providers have an interest in identifying and

treating patients with risk, however they hesitate related to lack of knowledge (Gabram et al.,

2009). Kne et al. (2017) identified that the three contributing factors limiting the use of high-risk

services include identification by the provider of high-risk patients, appropriate referrals to

services for patients at high-risk, and follow through by the patient. Brafford and Bush (2016)

identified that the main reason for lack of compliance by the patient with high-risk care is the

expense related to advanced imaging.

The evidence is overwhelming that the PCPs must improve screening to capture and refer

these patients. It is expected that the patients will more readily follow the advice of their PCP if

they engage in shared decision-making about a referral. Once the patient has been identified and

mutual agreement between the PCP and the patient is made about a referral to a high-risk

program, the high-risk team is in the unique position to take the burden of high-risk care from the

PCPs and instead work in collaboration to meet the preventative care needs of the patient (Cadiz

et al., 2013).

Primary care providers in Snohomish County typically have twenty-minute appointments

with each patient. It is difficult for the provider to gather all the necessary information about

breast cancer risk in that time period, especially when patients present for other pressing health

concerns. Additionally, patients are not always prepared to answer detailed questions about

family history during a short primary care visit. Several websites offer education, guidance or

tools to use in the care for the patients at high-risk. Many screening tools have been developed

for use during the PCP visit with the patient, but no specific tool has proven to be an

overwhelming favorite (Quillin et al., 2013). The Providence Health Systems Breast Cancer

Clinical Practice Guidelines committee has created a tool (Appendix A), however it is not known

to be widely used. To improve compliance with the use of screening tools in the primary care

setting, education about high-risk, as well as information about local programs, must be

delivered to the PCP to assist in the care of these patients.

The review of literature search regarding high-risk breast programs produced no data

regarding educational programs aimed at educating the health care provider or otherwise. Five

articles about the education of health care providers using eLearning programs were considered

for this project, as they offered insight into developing a module about high-risk programs based

on the experience of the authors in other areas of health care. These articles discussed the format

in which the authors used, as well as the tools they used to develop and evaluate their content.

The experience of these authors (discussed below) was considered in developing this project.

A variety of educational platforms were used among different authors in creating learning opportunities for health care providers. In each article reviewed, it did not appear that a common framework, specific to the learner population, was chosen, however each article reviewed appeared to have a holistic approach to their content design. Each article discussed knowledge of the provider regarding the topic, but also included information about communication and behavior of health care profession in delivering care to the patient.

One article described a study that used the Medscape Educational Platform (Buriak & Potter, 2013) to deliver an education module regarding cancer survivorship planning to multidisciplinary professionals including registered nurses, nurse practitioners and physicians. This type of study had high participation because it was open to various providers. Another project that yielded good results used the American Association of Nurse Practitioners Continuing Education (AANP-CE) platform to educate nurse practitioners about culturally sensitive care concerning cervical cancer disparities among American Indian women (Peltier, 2015). Delf (2012) described a process for educating non-medical personnel about bone scans using an independent virtual learning platform with software to build and deliver the program, which also showed promising results.

Finally, two articles offered educational opportunities to health care professionals with at least part of the experience completed in an on-line format. Bryant, Puri, Dix, and Ahmed (2016) offered an in-person class for health care professionals, mainly midwives, about delivering patient education regarding Down's Syndrome. They used an on-line platform for surveying their population at three different intervals following the provider education. Their results also showed good evidence that learning and behavior change occurred. Gregg and Twibell (2016) studied the effect of a program where graduate nursing students learned about

stress management strategies offered through on-line coursework at Ball State University.

Following the class and some self-exploration of different methods, the participants were

surveyed at different intervals to assess the effects. The project included learning, practicing and

teaching components to allow for empathetic care of patients in the future by first discovering

one's own ability to manage stress (Gregg & Twibell, 2016). Again, the results were positive.

It is important to consider the tools these authors used to design and evaluate their

programs for optimal learning. Two articles discussed the use of the ADDIE (analysis, design,

development, implementation and evaluation) instructional system model to develop their

content (Buriak & Potter, 2013; Delf, 2012). Buriak and Potter (2013) also included the use of

Mayer's "Twelve evidence-based principles for multimedia-modality, interactivity and special

contiguity" and Gagne's "Nine Events of Instruction" to provide guidance in the development of

an eLearning module while using anecdotal, case-based presentation of learning material. It

reached a wide variety of providers and concluded that this type of learning has the potential to

reach around the globe delivering education while collecting data from different areas of

practice. Peltier (2015) used the Knowles' five principles of adult learning to develop the

presentation which was well received by nurse practitioners over a large geographic area in the

United States; however, because it was offered through the AANP-CE platform, it was limited to

nurse practitioners, and the few other disciplines who accessed the site for education materials.

It was concluded that this material would benefit all types of providers, and therefore, should be

shared through different platforms (Peltier, 2015).

Three of the articles reviewed used the Kirkpatrick Model (2016) to guide the design and

survey of the material, as it considers four elements of educational design which include

reaction, learning, behavior and results. Bryant, Puri, Dix, and Ahmed (2016) identified that

using the Kirkpatrick Model includes the identification of the learning objectives from an

organizational perspective. This is especially important because those who work with the

implementation of evidence into practice are the experts, who by default, recognize the lack of

knowledge among a community. Gregg and Twibell (2016) further added to this by including the

most recent expansion to the Kirkpatrick Model which considers learner engagement and

perceived relevance under the first element of reaction. Engagement and relevance of

educational material are important factors to consider in changing behavior. Delf (2012)

identified that eLearning proved to be effective at renewing interest and insight into practice,

thus changing behavior, which is the third element of the Kirkpatrick Model. Addressing the four

elements of the Kirkpatrick Model in the development and analysis of eLearning appears to be

an effective and useful tool that is often preferred especially in this type of learning environment.

When developing an eLearning module for educating PCPs about high-risk breast

programs, it is important to use a platform that is accessible to all providers including physicians,

nurse practitioners and physician's assistants in one community. Limiting this to one discipline

will not achieve the desired outcome to educate and evaluate learning of all PCPs around this

topic. Evidence indicates that this type of education is needed in health care today, especially for

all PCPs who are key stakeholders in identifying patients at high-risk. It is also important to

include guidelines or development methodology to ensure that content, objectives, and questions

are created with the learner population in mind. Using the Kirkpatrick Model allows for

consideration of important elements of educational design to create effective learning

opportunities for health care providers.

Evidence Based Practice: Verification of Chosen Option

The evidence-based practice guidelines that were reviewed and chosen for this project are those defined by the NCCN (2017) (Appendix B) for women with a greater than twenty percent lifetime risk of developing breast cancer. The NCCN is comprised of world-renowned scientists and researchers who collaborate and review the latest evidence. When creating and updating their recommendations, professionals gather from institutions around the globe to participate in an on-going and iterative process to set guidelines for clinicians to follow regarding cancer and risk. The NCCN follows the same grading system as many other organizations setting guidelines based on clinical research and scientific evidence. For the care of women at high-risk for breast cancer, their grade of the evidence is 2A: Based on lower-level evidence, the consensus of the NCCN team deems the interventions as appropriate (NCCN, 2017). Recommendations in accordance with these guidelines include the following: 1. A clinical encounter every six to twelve months to begin at the age identified as being at higher risk, 2. Referral to a genetic professional if not already done, 3. Annual screening mammogram (preferably with tomosynthesis), 4. Annual breast MRI, 5. Consideration of risk reducing strategies, and 6. Self-breast awareness enabling patients to promptly report any changes (NCCN, 2017).

Understanding that patients referred for high-risk care may incur the emotional stress and costs of increased screening (depending on insurance and coverage benefits), education to the provider will emphasize that prevention and early detection of breast cancer is proving to be beneficial for the high-risk group. One systematic review showed that MRI alone increased sensitivity in detecting breast cancer, however centers employing strategies that include MRI, mammography, and clinical breast exam have shown sensitivity of 93-100% (Lord et al., 2007). A recent meta-analysis concluded that when screening patients of all ages with a strong familial history of breast cancer with both MRI and mammography, sensitivity increased to 98% (from

55% sensitivity with mammography alone); however, this may lead to decreased specificity and may increase false positives and over diagnosis (Phi et al., 2017).

As evidenced by the literature, it is especially important for PCPs to know how to identify and refer patients who fall into the higher risk category to prevent over diagnosis. This is the very reason screening recommendations exist for women at average risk, but also why there is so much controversy and disagreement among groups about screening for average risk. Experts agree that risk-based, individualized screening is important to reduce the burden of over diagnosis and diminish the morbidity of treatment (Monticciolo, Helvie, & Henrick, 2017). In other words, it is crucial that PCPs and patients understand risk and how to best screen patients based on their risk. The NCCN has created guidelines for high-risk patients because they benefit from additional screening efforts to prevent or catch cancer at an early stage. Sharing this information through a learning module will prepare the PCP to identify and refer patients who qualify for this care.

Theoretical Framework/Evidence Based Practice Model

The Theory of Diffusion of Innovation was developed by Everett Rogers (2003) and describes the process by which to diffuse new knowledge to a social group. It considers aspects of how to diffuse technology, or innovation, among groups. Because the concept of high-risk breast programs is a fairly new one, an educational module was created for this project to assist providers in identifying patients at high-risk, and to help understand the recommendations and health management for these patients. Rogers' theory suggests that one key aspect of diffusing innovation is by forming early adopters to help spread new information among a population (Rogers, 2003). Additionally, the theory discusses stages by which innovation is diffused among groups (Appendix C). These steps include dissemination, adoption, implementation and

maintenance. It is important to consider that educational modules must address key components of learning so that the learners will engage in the information and spread it amongst their social group. Once full understanding about risk and appropriate care for those at high-risk becomes well recognized among providers and patients alike, the information will have successfully diffused among the population.

Methods

To provide a meaningful learning opportunity for the providers in the community about high-risk breast programs, this quality improvement project included the development of an internet-based education module that was delivered to PCPs of adult patients (including family practice and internal medicine). The learning module was developed using the NCCN guidelines for high-risk individuals (National Comprehensive Cancer Network, 2017). Early adopters of this innovation were identified as three physician leadership champions and one clinic manager champion. One champion was located at each of the four sites who communicated with and encouraged PCPs to participate and learn this content in order to promote and support best practice.

Goals and Objectives

The goal of this project was to educate primary care providers about high-risk breast programs and how high-risk specialty care may serve as an adjunct in preventative care in collaboration with the PCP. Understandably, PCPs have a number of priorities during an office visit. Breast health is one of many items assessed during the routine health physical. Acknowledging this is necessary to gain the support of the PCP.

The objectives for this project were developed considering the four elements of educational design including reaction, learning, behavior and results (Kirkpatrick, 2016). The

objectives were: 1. Present information that is relevant and engaging to capture buy-in from PCPs, 2. Educate PCPs with evidence-based recommendations to give them the knowledge to engage in shared decision-making with their patients, and 3. Influencing the PCP's behavior to appropriately refer patients to experts who will then reduce the burden of high-risk breast care on their practice. The true organizational benefits from the accomplishment of these three objectives will be seen moving forward, as the time limits on this project cannot fully capture the extent of impact.

Survey Design

The Kirkpatrick model has previously been used for more than 50 years for survey design, many in health care settings, to evaluate goals and objectives, generating evidence beyond the learners' behaviors and attitudes (Leslie et al., 2013). Addressing reaction, an essential component of evaluation, gives the researcher insight and feedback regarding the participants attitude toward the learning modality; however, positive feedback does not necessarily indicate that learning has occurred (Rouse, 2011).

The second level of evaluation addresses whether learning has occurred. Learning is often determined best when a pretest and posttest are analyzed using a statistical test, such as the t-test; however, the acquisition of knowledge does not indicate that the behavior of the participant will change (Rouse, 2011). Analysis of behavioral changes is the third level of evaluation using the Kirkpatrick Model. The extent to which a participant applies their new knowledge and changes their behavior is key in successful project design (Bryant, Puri, Dix, & Ahmed, 2016). Results can be measured only after the first three levels of learning have been addressed and adequate time has passed to observe results.

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Project Site and Population

The project took place in Snohomish County, Washington. The county has nearly 780,000 residents, making it the third largest county in Washington with a predominantly Caucasian population (80%), but also including Hispanics (9%), Asians (10%), African-Americans (3%) and Native Americans (1.5%) (Vance-Sherman, 2015). Four large practices were chosen based on their practice locations (with more than two satellite clinics serving different areas of the county) and practice size (had at least 10 qualified providers.) A total of 103 providers were identified as eligible with one practice having 21 PCPs who were either internists or family practice providers, the second having 35 providers, the third having 34 providers, and the fourth having 13 providers.

Ethics and Human Subjects Protection

This eLearning project was reviewed by the University of Massachusetts Amherst Institutional Review Board and certified as exempt on January 17, 2018 (Appendix G). The project did not involve contact with any patients. Providers were contacted for participation via champions within their own organizations to allow for complete anonymity. The DNP student was not notified of the names of participants by the champions. The DNP student emailed a link to the champions who disseminated the link to the primary care providers of adult patients. The link connected the participant directly to the module for anonymous completion. No identifying information was collected from the participants. All the results were collected by the Microsoft Mix platform in aggregate form.

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Results

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The link to the eLearning module entitled "Identifying and Managing Patients at High-risk for Breast Cancer", with a pretest and posttest integrated into the format, was sent out to 103

PCPs in Snohomish county over a 30-day period. Twenty-three (22.3%) participants completed the pretest, module and posttest. There were no partially completed pretests or posttests, but there was a total of 33 views, indicating that the module was viewed but not completed by ten participants. The follow-up survey link was sent out to the same group of participants via the clinic champions after the module closed. It remained open for 30 days with a total of ten participants completing the survey.

The participants included advanced practice nurses (47%; n = 11), physicians (39.1%; n = 9) and physician's assistants (13.0%; n = 3). The years of service for the participants was evenly distributed with 21.7% (n = 5) having practiced ten or more years, 26.1% (n = 6) having practiced 5-10 years, 26.1% (n = 6) having practiced 2-5 years, and 26.1% (n = 6) having practiced less than two years.

Development of the learning module occurred between November and December 2017. The Microsoft Mix Platform was used to create the eLearning module because it is user friendly, allowed for anonymity, and allowed for easy integration of the pretest and posttest, as well as data collection. Content slides (Appendix D) based on the objectives were created specifically for this module. The module introduced the topic and information regarding implied consent, then proceeded to an integrated pretest, followed by 17 slides with learning content, then concluded with a posttest and evaluation. The module was narrated but gave the participants the ability to proceed through slides at their own pace. The entire length of the narrated module was six minutes, however the participants had the ability to move forward and backward as needed to review each slide. In being mindful of limited time the PCPs may have to complete this module, the intent was that the participants spend the time they needed to complete the module, but not take more than an estimated 20 minutes.

Repeated measures surveys using a Likert Scale were presented to the PCP participants

using questions that related to reaction, learning, behavior and results, as well as questions

regarding demographics and current practices (Table 1).

Table 1. Survey questions and relationship to Kirkpatrick model

Model Level	Questions	Measure	Survey
1. Reaction	This training format was beneficial to my schedule.	Five-point Likert-type categorical scale (strongly agree to strongly disagree)	2
	This training is important for primary care providers.		2
2. Learning	I use a screening tool to identify risk.	Five-point Likert-type categorical scale (strongly agree to strongly disagree)	1, 2
	I understand current recommendations for high-risk patients.		1, 2
	I educate my patients regarding risk for breast cancer.		1, 2
3. Behavior	I refer patients to experts for high-risk care.	Five-point Likert-type categorical scale (strongly agree to strongly disagree)	1, 2
	I engage my patients in shared decision-making.		1
	I collaborate with experts regarding high-risk care.		1
4. Results	Since training, I more often refer patients for risk assessment.	Five-point Likert-type categorical scale (strongly agree to strongly disagree)	3
	Since training, my collaboration with experts has increased.		3
	This training has helped reduce burden on my practice.		3

There was a pretest (n = 23) before engaging in the learning section, a posttest (n = 23) and an

evaluation immediately following the learning section. It was accessible between February 1,

2018, and March 1, 2018. A short follow-up survey (n = 10), to assess results related to

behavioral change and patient care impact, was then conducted in the month following the initial

learning module. It was available March 1, 2018, through March 30, 2018, following the closure

of the initial module. The third survey did not take more than five minutes to complete. Many

of the questions in these surveys addressed the four levels of evaluation: reaction, learning,

behavior and results, based on goals and objectives created by the DNP student and experts in

the in high-risk breast care within the community. Participants were asked about when they

discuss breast cancer risk with their patients. The majority, 65.2% (n = 15), answered that they

address risk during routine physical exams, while 26.1% (n = 6) answered that they only discuss

risk if the patient initiates it, and 8.7% (n = 2) answered that they only discuss risk when there is

a breast issue. None of the participants denied ever discussing risk with their patients. The

participants were also asked about which resources they use to assess patients for risk, with

65.2% (n = 15) using the United States Preventative Services Task Force (USPSTF), 21.7% (n =

5) using the American Cancer Society, and 13.0% (n = 3) not using any resources. None of the

participants use the National Comprehensive Cancer Network (NCCN) guidelines to guide risk

assessment.

  The reaction to the teaching module was overall positive. Table 2 summarizes the results

from the questions regarding the participants reaction to the module. Questions assessed the

participants beliefs about the material and the format in which the material was presented. A

Likert scale was used to rate answers as: Strongly agree (5), Agree (4), Neutral (3), Disagree (2),

and Strongly disagree (1).

Table 2. Reaction to module (n = 23)	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
Questions					
This training is beneficial to my schedule	10 (43)	11 (47.8)	2 (8.7)	0	0
Risk training is important for PCPs	11 (52.2)	11 (52.2)	0	0	0
Material presented is relevant to my practice.	10 (43.5)	10 (43.5)	3 (13)	0	0
This learning improves the care I deliver.	4 (17.4)	15 (65.2)	3 (13)	1 (4.3)	0
This learning promotes collaboration among providers of care.	1 (4.3)	15 (65.2)	7 (30.4)	0	0
This learning enhances my awareness of resources in our community.	0	13 (56.5)	7 (30.4)	2 (8.7)	1 (4.3)

Although corresponding value for each answer was not needed for statistical analysis in this section, it was used for questions in upcoming sections. Each question collectively scored over 50% in the "Strongly agree" and "Agree" categories of the Likert Scale.

Repeated measure survey questions addressed the learning and behavioral components of the module. To evaluate the statistical significance of learning and impact on behavior the participant gained from this module, a comparison of pretest and posttest answers in these areas were analyzed using a paired sample t-test with an alpha set at .05 to assess the null hypothesis that the 5-point Likert scale rating on the pretest is equal to 5-point Likert scale rating on the posttest. Table 3 lists the topics of questions regarding knowledge and behavior, then gives the number of participant answers and percentage for each question from the pretest and posttest, and the paired t-test analysis of each category.

Table 3. Knowledge and behavior repeated measure analysis (n = 23)

	Pretest n, (%)	Posttest n, (%)	Mean	Std. Dev.	*t*	*df*	*sig.*
Knowledge							
Understand recommendations			-0.8696	1.14035	-3.657	22	0.001
5-Strongly agree	2 (8.7)	5 (21.7)					
4-Agree	3 (13.0)	14 (60.9)					
3-Neutral	12 (52.2)	4 (17.4)					
2-Disagree	6 (26.1)	0					
1-Strongly disagree	0	0					
Educate patients about risk			-0.2174	1.1264	-0.926	22	0.365
5-Strongly agree	2 (8.7)	4 (17.4)					
4-Agree	15 (65.2)	14 (60.9)					
3-Neutral	3 (13.0)	4 (17.4)					
2-Disagree	3 (13.0)	1 (4.3)					
1-Strongly disagree	0	0					
Behavior							
Use of a screening tool			-1.4783	0.73048	-9.71	22	0.000
5-Strongly agree	0	0					
4-Agree	1 (4.3%)	15 (65.2)					
3-Neutral	4 (17.4)	8 (34.8)					
2-Disagree	16 (69.5)	0					
1-Strongly disagree	2 (8.7)	0					
Likelihood to refer for risk assessment			-1.3913	1.37309	-4.859	22	0.000
5-Strongly agree	2 (8.7)	4 (17.4)					
4-Agree	0	14 (60.9)					
3-Neutral	5 (2107)	3 (13.0)					
2-Disagree	16 (69.7)	2 (8.7)					
1-Strongly disagree	0	0					

Paired sample *t*-test with alpha set at .05

Two questions evaluated whether knowledge had been acquired after participating in the learning module. The question asked the participants about understanding current recommendations for assessment of high-risk patients found there was a statistically significant difference, thereby rejecting the null hypothesis that learning would not be a significant difference between the pretest and posttest. For the question regarding the education of patients

by the participant regarding high-risk, there was not a statistical difference between the pretest

and posttest, thereby failing to reject the null hypothesis.

Two questions were used to evaluate the behavior of the participants, rather the

confidence that the participant had that the learning would influence their behavior. The first

question was regarding the use of a screening tool in the practice setting, and the second question

asked about the likelihood that the participant would appropriately refer for risk assessment.

There was a statistically significant change from the pretest to the posttest, allowing the rejection

of the null hypothesis that behavior change would not occur.

The participation in the follow-up survey was low (n = 10), but the results appear to be

positive. The questions below (table 4) assessed whether the participants had sustained

behavioral changes related to their learning.

Table 4. Results follow-up survey	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Questions					
I more often consider individualized breast cancer risk for my patients.	0	6 (60.0)	3 (30.0)	1 (10.0)	0
I am now using an assessment tool to screen my patients for breast cancer risk.	0	3 (30.0)	4 (40.0)	2 (20.0)	1 (10.0)
I know what specialized resources are available to reduce the burden of high-risk breast care on my practice.	3 (30.0)	5 (50.0)	2 (20.0)	0	0
My collaboration with experts/peers regarding patients at high-risk for breast cancer has increased.	0	3 (30.0)	5 (50.0)	1 (10.0)	1 (10.0)

The results of the follow-up survey after one month indicate that PCPs are more likely to

consider individualized risk for their patients (60% favorable), and have knowledge about how to

reduce the burden of high risk breast care on their practice (80% favorable). The use of a

screening tool, as well as collaboration with experts about high risk care remained neutral.

Discussion

This project provided an eLearning module to providers to help them understand the

current recommendations regarding the patient at high-risk for breast cancer. The objectives for

this project were met through the presentation of information that was relevant and engaging to

capture buy-in from PCPs. Primary care providers were educated about evidence-based

recommendations to enable them to engage in shared decision-making with patients about high

risk. Additionally, PCP's behavior was influenced to appropriately refer patients to experts who

reduce the burden of high-risk breast care on their practice. The participating PCPs, 22.3% of

the identified population, were surveyed with a pretest and posttest built into an eLearning

module. An additional follow-up survey was sent out 30 days after the initial module, of which

9.7% participated.

The reaction to the module from participants was positive. Questions regarding reaction

to the eLearning module were answered with the majority stating that the format was beneficial

to their schedule, the training was important and relevant to their practice setting, the training

improved care delivery, and that it enhanced resource awareness and collaboration.

Kirkpatrick (2016) states that positive reaction to learning is crucial in successful

learning, and eLearning appears to be a beneficial method of education for busy PCPs. Despite

the use of champions at each practice location, the participation by PCPs was not as high as

anticipated. The thought was that the ease in which the PCP population could access the

modules on their own would positively influence participation. The champions themselves were

busy practice leaders and likely did not continually remind their PCPs to take the survey as often as had hoped.

Rogers' theory (2003) discusses that adoption of innovation is a key step in diffusing it into a population, however it must be followed by implementation and maintenance, the third and fourth characteristics of the diffusion of innovation process. While the champions were considered the early adopters, the implementation process needs more support to get the information out to a wider group of participants. It does appear that a representative sample of PCPs participated proving that the education about high-risk breast care is lacking and needs to be diffused overall.

Many of the questions help gain insight to the current practices of the PCPs in this community, including the engagement in shared decision-making with their patients. The module educated the PCPs about the NCCN guidelines, educating their patients routinely, and offered guidance about using a tool and referring to specialists when needed. Not many PCPs in this group were using a tool to help screen for high-risk patients, and none of the participants were using the NCCN guidelines to help guide their treatment of patients. The lack of tool usage may be directly related to lack of valid tool availability; however, it may also be a cumbersome and time-consuming process. While some tools used in health care have been validated and are used repeatedly, there has not been a standard tool developed for breast risk assessment. The PCPs and patients are also bombarded with conflicting information about breast care from different organizations, so it is often difficult to understand what should be done. The NCCN guidelines (2017) offer clear and concise direction for the treatment of patients, however the PCPs do not appear to consistently use these guidelines, as most appeared to follow the USPSTF guidelines.

The eLearning module did positively impact the PCPs ability to engage with their patients. Significant improvements in both knowledge and confidence in behavioral changes were observed. This population now understands that the NCCN guidelines are a concise resource, are more likely to consider using a tool in their practice to screen for risk, and are more likely to refer for assessment with an expert. Although the use of a tool and the willingness to collaborate remained neutral in the follow-up survey, this survey only captured a small number of participants. The analysis between the pretest and posttest indicated a very significant improvement in willingness to use a screening tool and collaborate with an expert, however lack of a valid tool and limited breast care experts in the community are likely contributing to the neutrality of the follow-up survey answers. Additionally, greater than one month may be needed to adequately assess the impact of the learning.

The education of patients by the PCP was the only area tested where significant improvement was not observed following the learning. This was an interesting finding because risk for breast cancer is not adequately addressed in the primary care setting according to the participants. While the majority of this population screen for risk during the annual exam, approximately 35% do not address it yearly. Breast cancer risk potentially changes yearly for patients related to health changes, family history changes, and age.

Risk should be addressed yearly and patients must be aware of risk to ensure it is included in their routine care. This must be an area of education that the PCP covers while assessing for other risks, although anecdotal evidence from patients suggests that discussion regarding the initiation of mammography is as far as the conversation goes between the patient and PCP in many instances. This may be related to the numerous health topics that patients address with their providers in the limited time available during routine exams, however it

remains important for the provider to consider the patient's personal and family history.

Individualized risk assessment is necessary for thorough preventative care, and this appears to be

a current deficit in primary care.

Limitations

The main limitation with this project was the lack of participation from providers.

Education of the PCP regarding high-risk breast care was found to be valued, however the

overall participation was expected to be higher, especially because each site had a champion to

help spread the value of this education. For future efforts in educating PCPs, incorporating more

of an incentive should be used to entice more participation. Continuing education credits

combined with longer module availability may improve participation. It may also be helpful to

understand if providers are currently bombarded with learning modules on various topics despite

their convenience.

Changing the delivery of the education may be beneficial as well. Although eLearning

modules are often well-received related to their ease in access, in-person delivery of breast

cancer risk education may be beneficial in capturing an audience, as well as answering questions.

Given the length of the eLearning module, this information may be easily translated into a

classroom format, thereby allowing brief teaching lessons during staff meetings or group

learning opportunities.

The comments made by a handful of participants at the final question of the evaluation

included a few common themes. Participants wanted a valid risk assessment tool to allow for

ease in screening. They also requested contact information for programs providing breast risk

and genetic health assessments in our area, but this was not given related to the research process

and unbiased approach to educating providers. Perhaps providing a comprehensive list of all

programs within a demographic area would be appropriate for future researchers. Two participants indicated wanting an open forum to ask questions; this reinforced the idea that an in-person learning option would likely be beneficial.

Conclusion

Patients at high-risk for developing breast cancer should be evaluated more frequently to prevent cancer, or at minimum, detect cancer in early stages. The USPSTF does not set guidelines for mammography of patients who are at high-risk, yet many PCPs are following the general guidelines for the average risk population. The NCCN (2016) has created evidence-based guidelines for the support and monitoring of patients who are found to be at high-risk, however, this evidence continues to be slowly disseminated.

This project aimed to educate primary care providers in one community about the science and value in high-risk breast programs. Through the use of an eLearning module, PCPs gained understanding about to how best manage this patient population while ensuring preventative care guidelines through collaboration with experts. Additionally, this education has shown significant improvements in knowledge and confidence in future behaviors, thereby empowering the PCP to engage patients in shared decision-making around preventative care for patients with high-risk for breast cancer.

References

Afonso, N. (2009). Women at high-risk for breast cancer- What the primary care provider needs to know. *Journal of the American Board of Family Medicine, 22*(1), 43-50. doi:10.3122/jabfm.2009.01.070188

American Cancer Society. (2017). *American Cancer Society Breast Cancer Screening Guideline*. Retrieved from Cancer.org: https://www.cancer.org/latest-news/special-coverage/american-cancer-society-breast-cancer-screening-guidelines.html

American College of Radiology. (2014). *ACR statement on breast tomosynthesis*. Retrieved from American College of Radiology: https://www.acr.org/About-Us/Media-Center/Position-Statements/Position-Statements-Folder/20141124-ACR-Statement-on-Breast-Tomosynthesis

American College of Radiology. (2017). *ACR and SBI continue to recommend regular mammography starting at age 40*. Retrieved from acr.org: https://www.acr.org/About-Us/Media-Center/Press-Releases/2015-Press-Releases/20151020-ACR-SBI-Recommend-Mammography-at-Age-40

Berg, W., Zhang, Z., Lehrer, D., Jong, R., Pisano, E., Barr, R., . . . Gabrielli, G. (2012). Detection of breast cancer with addition of annual screening ultrasound or a single screening MRI to mammography in women with elevated breast cancer risk. *JAMA, 307*(13), 1394-404. doi:10.1001/jama.2012.388

Brafford, A., & Bush, A. (2016). Model for a multidisciplinary cancer risk clinic in a community setting. *Journal of Oncology Navigation and Survivorship, 7*(9), 49-50.

Bryant, L. D., Puri, S. C., Dix, L., & Ahmed, S. (2016). Tell it Right, Start it Right: An

    evaluation of training for health professionals about Down syndrome. *British Journal of*

    Midwifery, 26(2), 110-117.

Buriak, S., & Potter, J. (2013). Impact of on online survivorship primer on clinician knowledge

    and intended practice changes. *Journal of Cancer Education, 29*, 114-121.

Cadiz, F., Kuerer, H. M., Puga, J., Camancho, J., Cunill, E., & Arun, B. (2013). Establishing a

    program for individuals at high-risk for breast cancer. *Journal of Cancer, 4*(5), 433-446.

    doi:10.7150/jca.6481

Delf, P. (2012). Designing effective learning for health care professionals. *Radiography, 19*(4),

    315-330. doi:10.1016/j.radi.2013.06.002

Dingfelder, H. E., & Mandell, D. S. (2010). Bridging the research-to-practice gap in autism

    intervention: An application of Diffusion of Innovation Theory. *Journal of Autism*

    Development Disorder, 41, 597-609.

Drohan, B., Roche, C., Cusack, J., & Hughes, K. (2012). Hereditary Breast and Ovarian Cancer

    and Other Hereditary Syndromes: Using Technology to Identify Carriers. *Annals of*

    Surgical Oncology, 19, 1732-1737. doi:10.1245/s10434-012-2257-y

Gabram, S. G., Dougherty, T., Albain, K. S., Klein, K., Mumby, P., Lee, K., . . . Lund, M.

    (2009). Assessing breast cancer risk and providing treatment recommendations:

    Immediate impact of an educational session. *The Breast Journal, 15*, 39-45.

    doi:10.1111/j.1524-4741.2009.00805.x

Gregg, S. R., & Twibell, K. R. (2016). Try-It-On: Experiential learning of holistic stress management in a graduate nursing curriculum. *Journal of Holistic Nursing, 34*(3), 300-308. doi:10.1177/0898010115611788

Kirkpatrick, J. D., & Kirkpatrick, W. K. (2016). *Kirkpatrick's Four Levels of Training Evaluation.* Alexandria: Association for Talent Development.

Kne, A., Zierhut, H., Baldinger, S., Swensen, K. K., Mink, P., McCarthy Veach, P., & Tsai, M. L. (2017). Why is cancer genetic counseling underutilized by women identified as at risk for hereditary breast cancer? Patient perceptions of barriers following a referral letter. *Journal of Genetic Counseling, 26*(4), 697-715.

Leslie, K., Baker, L., Egan-Lee, E., Esdaile, M., & Reeves, S. (2013) Advancing faculty development in medical education: a systematic review. *Academic Medicine, 88*(7), 1038–45. doi: 10.1097/ACM.0b013e318294fd29

Lord, S. J., Lei, W., Craft, P., Cawson, J. N., Morris, I., Walleser, S., . . . Houssami, N. (2007). A systematic review of the effectiveness of magnetic resonance imaging (MRI) as an addition to mammography and ultrasound in screening young women at high-risk of breast cancer. *European Journal of Cancer, 43*(13), 1905-1917. doi:10.1016/j.ejca.2007.06.007

Monticciolo, D. L., Helvie, M. A., & Hendrick, R. E. (2017). Current issues in the overdiagnosis and over treatment of breast cancer. *American Journal of Roentgenology*, 1-7. doi:10.2214/AJR.17.18629

National Comprehensive Cancer Network. (2016). *NCCN Guidelines Version 1.2016 Breast*

   Cancer Screening and Diagnosis. Retrieved from NCCN.org:

   https://www.nccn.org/professionals/physician_gls/pdf/breast_risk.pdf

National Comprehensive Cancer Network. (2017). *NCCN Categories of Evidence and*

   Concensus. Retrieved from National Comprehensive Care Network:

   https://www.nccn.org/professionals/physician_gls/categories_of_consensus.aspx

Peltier, A. E. (2015). *Addressing cervical cancer disparities among American Indian women:*

   Implementing an educational module for health care providers. Ann Arbor: Proquest

   LLC.

Phi, X., Houssami, N., Hooning, M. J., Riedl, C. C., Leach, M. O., Sardanelli, F., . . . de Bock, G.

   H. (2017). Accuracy of screening women at familial risk of breast cancer without a

   known gene mutation: Individual patient data meta-analysis. *European Journal of*

   Cancer, 8531-38. doi:10.1016/j.ejca.2017.07.055

Providence Health and Services. (2016). *What are your patient's screening mammography*

   options? Portland.

Quillin, J. M., Kirst, A. H., Gyure, M., Corona, R., Rodriguez, V., Borzelleca, J., & Bodurtha, J.

   N. (2014). Patient-reported hereditary breast and ovarian cancer in primary care practice.

   Journal of Community Genetics, 5, 179-183. doi:10.1007/s12687-013-0161-1

Raikhlin, A., Curpen, B., Warner, E., Betel, C., Wright, B., & Jong, R. (2015). Breast MRI as an

   adjunct to mammography for breast cancer screening in high-risk patients: Retrospective

   review. *American Journal of Roentgenology, 204*, 889-897. doi:10.2214.AJR.13.12264

Rogers, E. (2003). *Diffusion of Innovations* (5th ed.). New York: The Free Press.

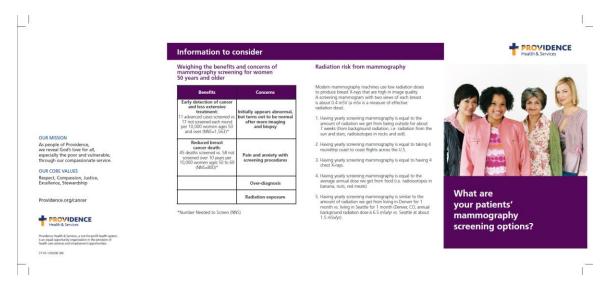US Preventative Services Task Force. (2013, December). *Final Recommendation Statement: BRCA-Related Cancer: Risk Assessment, Genetic Counseling, and Genetic Testing.* Retrieved from US Preventative Services Task Force: https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/brca-related-cancer-risk-assessment-genetic-counseling-and-genetic-testing

US Preventative Services Task Force. (2016, February). Retrieved from http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/breast-cancer-screening1

Vance-Sherman, A. (2015). *Washington State Employment Security Department*. Retrieved from Snohomish County Profile: https://fortress.wa.gov/esd/employmentdata/reports-publications/regional-reports/county-profiles/snohomish-county-profile

Vanstone, M., Chow, W., Lester, L., Ainsworth, P., Nisker, J., & Brackstone, M. (2012). Recognizing BRCA gene mutation risk subsequent to breast cancer diagnosis in southwestern Ontario. *Canadian Family Physician, 58*(5), 258-266. Retrieved from https://www-ncbi-nlm-nih-gov.silk.library.umass.edu/pmc/articles/PMC3352812/

Vroomen, M. D. (2017). *Breast density notification laws by state*. Retrieved from Diagnostic Imaging: http://www.diagnosticimaging.com/breast-imaging/breast-density-notification-laws-state-interactive-map

Appendix A. Providence Health System Breast Cancer Risk Screening Tool

Breast Cancer Risk Screening Tool (Providence Health System, 2016)

**Appendix B. National Comprehensive Cancer Network Guidelines: Breast Cancer
Screening and Diagnoses Version 1.2017**

Women who have a lifetime risk >20% as defined by models that are largely dependent on family history:

- Clinical encounter every 6-12 months
    - To begin when identified as being at high-risk
    - Referral to genetic counseling if not already done
- Annual screening mammogram
    - To begin 10 years prior to the youngest family member but not less than age 30 years
    - Consider tomosynthesis
- Recommend annual breast MRI
    - To begin 10 years prior to the youngest family member but not less than age 25 years
- Consider risk reduction strategies
- Breast awareness

Breast Cancer Screening and Diagnoses Version 1.2017 (NCCN, 2017)

Appendix C. Roger's Theory Components

The Innovation-Decision Process (Dingfelder & Mandell, 2010)

Dissemination	Adoption	Implementation	Maintenance
Strategies to make potential adopters aware of innovation	Commitment to begin using innovation (consider 5 variable)	Putting innovation to use	Degree to which innovation is used over time.

PERCEIVED CHARACTERISTICS OF THE INNOVATION:

1. Relative Advantage
2. Compatibility
3. Complexity
4. Trialability
5. Observability

Appendix D. eLearning Module Slides and Follow-up Survey Outlines

▶ **MODULE 1. Identifying & Managing Patients at High Risk for Breast Cancer**
An eLearning Module for Primary Care Providers

Introduction & Purpose
WHAT: Brief eLearning module for PCPs (this is approximately 20 minutes in length.)

WHY: To gather info about current practices and inform PCPs about evidence-based guidelines.

WHO: All PCPS in Snohomish County willing to participate.

WHEN: Available for 30 days. A brief follow-up survey will be sent via email approximately one month following this initial survey.

WHERE: You're here!

THANK YOU FOR PARTICIPATING!!!

IMPLIED CONSENT
You are being invited to participate in a research study titled *Identifying and Managing Patients at High Risk for Breast Cancer.* This study is being done by *Erin Chaney, BSN, RN, DNP student,* from the University of Massachusetts Amherst. You were selected to participate in this study because *you are a primary care provider in Snohomish County, WA.*

The purpose of this research study is *understand the current practices of primary care providers around the screening of patients at high risk for breast cancer, as well as to give education to primary care providers about the management of these patients in accordance with evidence-based guidelines.* If you agree to take part in this study, you will be asked to complete an online survey/questionnaire. This survey/questionnaire will ask about *current practices, personal knowledge about the topic, beliefs and actions you have about the care of this population, and the reaction you have to this type of learning.* It will take you approximately 20 minutes to complete. Approximately 30 days following this module, you will receive a link to a short follow-up survey via email. This survey will take less than 5 minutes to complete.

You may not directly benefit from this research; however, we hope that your participation in the study may *will lead to the development of better screening practices and collaborative management of patients at high risk*.

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach of confidentiality is always possible. To the best of our ability your answers in this study will remain confidential. We have minimized any risks by

having your leadership distribute this module link to providers through email distribution lists and not including any questions that will lead to your identification. Additionally, you have accessed this module within a cloud-based platform that does not record any information except your answers to the survey questions.

Your participation in this study is completely voluntary. By continuing with this module, you are consenting to participate.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, ***Erin Chaney,*** echaney@umass.edu***, 425-346-5982, or, faculty advisor, Dr. Rachel Walker, PhD, RN, r.walker@umass.edu, 413-545-0250.*** If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or humansubjects@ora.umass.edu.

Thank you for your participation in this research.

PRETEST

CONTENT

WHEN TO START MAMMOGRAPHY?
AVERAGE RISK
USPSTF- Biennially at 50 years
ACS- Annually at 45 years
ACR- Annually at 40 years
ACOG- Annually at 40 years

HIGH RISK
USPSTF- May benefit from increase imaging
ACS- Annual mammography and MRI
ACR- Annual mammography and MRI
ACOG- Annual mammography and MRI

CONSIDERATIONS for DETERMINING RISK

Personal History

       History of breast or ovarian cancer
       Age
       Chest wall radiation
       Dense breast tissue
       History of breast biopsy (for any reason)
       Ashkenazi-Jewish Decent
       Lifestyle

CONSIDERATIONS for DETERMINING RISK

Family History

> Breast or ovarian cancer in any 1st or 2nd degree relative
> Age of family member at cancer diagnosis
> Known male breast cancer
> Limited family information (i.e. adoption) or limited female relatives
> Ashkenazi-Jewish Decent

CONSIDERATIONS for DETERMINING RISK

Genetic Mutations

> Known or suspected BRCA1/ BRCA2 mutation
> Other known or suspected genetic mutations including: ATM, CHD1, CHEK2, NBN, NF1, PALB2, PTEN, STK11, TP53 (p53)

PCPs Role

Breast Cancer Risk Screening Tool (Providence Health System, 2016)

Consider USING a tool

Considering Breast Density

Breast Density Levels

PATIENT EXPERIENCE WHEN REFFERED TO HIGH RISK PROGRAM

MODELS USED TO CALCULATE RISK

Meet with a breast care provider
Risk factors considered and software used to calculate lifetime risk
Greater than 20% lifetime risk is HIGH RISK
Annual Imaging/monitoring and lifestyle modification education provided
Genetic testing provided as indicated
Referrals to surgeon (prophylactic surgery) and oncology (chemo prevention) as indicated

Collaborative Care: DECREASING THE BURDEN OF CARE FOR PCPs

COST OF CARE

CASE STUDY
42-year-old, Caucasian female (no Jewish ancestry) visits her primary care for annual health check. She mentions that her 72-year-old mother has recently been diagnosed with recurrent breast cancer with metastases following a two-year remission. No other breast or ovarian cancers in maternal family known, but one maternal uncle died from throat cancer, and her maternal grandfather died from lung cancer with brain metastases.
Her paternal great-grandmother had breast cancer at age 55 years. Her paternal grandmother died of cancer at the age of 75 years, but the type of cancer was unknown (large abdominal tumors found just prior to death in 1993.) Her father has had basal cell carcinoma removed from his face in the past year. Neither the patient's father or grandmother had any female siblings.

The patient has two young daughters with no other pregnancies. Prior to having children, she took oral contraceptives for 10 years. She had a breast biopsy at age 18 years, which was a benign fibroadenoma. No other health problems. BMI is 38.

Two years prior, she decided to have a mammogram despite her previous PCP telling her that she probably didn't need to start screening mammography until age 50 years. She was found to have heterogeneously dense breast tissue.

WOULD YOU REFER THIS PATIENT FOR RISK ASSESSMENT?
Case Study Continued…
Risk assessment was discussed with the mammography technologist during her screening mammogram. Because patient has sisters and daughters, she felt it was appropriate to follow-up with a risk assessment. Additionally, she doubted that she was of average risk.
After giving a thorough history to the nurse practitioner at the High-Risk Clinic, she was found to have a lifetime risk of 38%. She then discussed this finding with her mother who confirmed that she had undergone genetic testing (following her second breast cancer diagnosis) and was found to not have any mutations. The patient then contacted the High-Risk provider and gave this information. The risk was recalculated and fell to 28%.
The patient was informed that genetic testing would be appropriate given her father's family history, however she decided to first ensure her life insurance policies were in order prior to testing.
Although she has been determined to be at high risk for breast cancer, she will not need to start annual MRIs until age 45 years per NCCN guidelines. She will, however, continue to be followed in the high-risk program with annual mammography, plus lifestyle modification including weight loss and exercise.

THANK YOU

YOUR PARTICIPATION IS GREATLY APPRECIATED
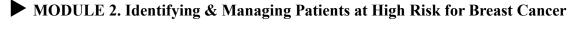PLEASE PROCEED TO THE POSTTEST AND EVALUATION

POSTTEST

In 30-60 days…

…You will receive another email link to a very short survey regarding this module, in an effort to assess whether this education impacted your practice.

Your participation in the short follow-up will be greatly appreciated to complete this project.

Thanks again!

EVALUATION

You are finished!

▶ **MODULE 2. Identifying & Managing Patients at High Risk for Breast Cancer**

Follow-up survey

IMPLIED CONSENT
You were being invited to participate in a research study titled ***Identifying and Managing Patients at High Risk for Breast Cancer.*** This study is being done by ***Erin Chaney, BSN, RN, DNP student,*** from the University of Massachusetts Amherst. You were selected to participate in this study because ***you are a primary care provider in Snohomish County, WA.***

The purpose of this research study is ***understanding the current practices of primary care providers around the screening of patients at high risk for breast cancer, as well as to give education to primary care providers about the management of these patients in accordance with evidence-based guidelines.*** If you participated in the initial eLearning module (a link was sent to you approximately 30 days ago) please complete this brief follow-up survey.
You may not directly benefit from this research; however, we hope that your participation in the study may ***will lead to the development of better screening practices and collaborative management of patients at high risk***.

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach of confidentiality is always possible. To the best of our ability your answers in this study will remain confidential. We have minimized any risks by ***having your leadership distribute this module link to providers through email distribution lists and not including any questions that will lead to your identification. Additionally, you have accessed this module within a cloud-based platform that does not record any information except your answers to the survey questions.***

Your participation in this study is completely voluntary. By continuing, you are consenting to participate.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, ***Erin Chaney,*** echaney@umass.edu***, 425-346-5982, or, faculty advisor, Dr. Rachel Walker, PhD, RN,*** r.walker@umass.edu***, 413-545-0250.*** If you have any questions concerning your rights as a research subject, you may contact the University of Massachusetts

Amherst Human Research Protection Office (HRPO) at (413) 545-3428 or
humansubjects@ora.umass.edu.

Thank you for your participation in this research.

Follow-up Questions

Considering the content of the eLearning module you reviewed within the past two months, please answer the following questions…

THANK YOU
YOUR PARTICIPATION IS GREATLY APPRECIATED
AGGREGATE FINDINGS OF THIS RESEARCH WILL BE SENT TO YOUR
LEADERSHIP FOR DISTRIBUTION FOLLOWING ANALYSIS.

Appendix E. Pretest and Posttest Questions

Question	Type	Survey
How often do you discuss risk regarding breast cancer with your patients?	Multiple choice: a) During routine physical exam b) Only when the patient asks c) Only when there is a breast concern d) I never discuss risk	1
What resources do you use to determine breast cancer risk?	Multiple Choice: a) USPSTF Guidelines b) ACS guidelines c) Institutional guidelines d) NCCN Guidelines d) Other:_____	1
REACTION		
This training was offered in a format that is beneficial to my schedule.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	2
This training is important for providers in primary care.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	2
LEARNING (Knowledge and Confidence)		
I use a screening tool in my practice to appropriately identify patients at high-risk for breast cancer.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1, 2
I understand the most current recommendations used to determine if patients are at high-risk for breast cancer.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1, 2
I appropriately educate my patients regarding high-risk.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1
This training has increased my knowledge to educate my patients about high-risk.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	2
BEHAVIOR		
I am confident that I refer patients for risk assessment appropriately.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1
This training has increased my confidence about referring patients for high-risk assessment.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	2
I routinely engage in shared decision making with my patients regarding breast cancer risk.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1, 2

I often collaborate with experts regarding breast cancer risk.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	1, 2
RESULTS (Institutional impact)		
Since receiving training, I more often refer patients for risk assessment at the Breast Center.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	3
Since receiving training, my collaboration with experts/peers has increased.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	3
I believe that training has given me resources to reduce the burden of breast care on my practice.	Likert scale (strongly agree, somewhat agree, neutral, disagree, strongly disagree)	3

Appendix F. Program Evaluation Questions

1. How many years have you been a healthcare provider?
   ☐ Less than 1 years
   ☐ 2-5 years
   ☐ 5+ years
   ☐ Greater than 10 years

2. What type of provider are you?
   ☐ Physician
   ☐ Advanced practice nurse (ARNP, FNP, AGNP, etc.)
   ☐ Physician's assistant
   ☐ Other: _____

3. Using the following scale, please rate (check the appropriate box) the following statements to best fit your evaluation of this educational offering:

Question	5-Point Likert Scale
The learning in this module is relevant to my practice.	
The learning in this module will improve the care I deliver to patients.	
This learning promotes collaboration among providers.	5=Strongly agree 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly disagree
This learning enhances my awareness of resources in my community.	
The author of this module demonstrates expertise of the subject matter.	

4. How do you feel about this module and eLearning as a method of learning? Please comment.

Appendix G. Investigational Review Board (IRB) Approval

University of Massachusetts Amherst
108 Research Administration Bldg.
70 Butterfield Terrace
Amherst, MA 01003-9242
Research Compliance

Human Research Protection Office (HRPO)
Telephone: (413) 545-3428
FAX: (413) 577-1728

Certification of Human Subjects Approval

Date: January 17, 2018

To: Erin Chaney, Nursing

Other Investigator: Rachel Walker, Nursing

From: Lynnette Leidy Sievert, Chair, UMASS IRB

Protocol Title: Managing Patients at High Risk for Breast Cancer: A Learning Module for Primary Care Providers (IRB 17-206)
Protocol ID: 2017-4408
Review Type: EXEMPT - NEW
Paragraph ID: 2
Approval Date: 01/17/2018
Expiration Date: 01/16/2021
OGCA #:

This study has been reviewed and approved by the University of Massachusetts Amherst IRB, Federal Wide Assurance # 00003909. Approval is granted with the understanding that investigator(s) are responsible for:

Modifications - All changes to the study (e.g. protocol, recruitment materials, consent form, additional key personnel), must be submitted for approval in e-protocol before instituting the changes. New personnel must have completed CITI training.

Consent forms - A copy of the approved, validated, consent form (with the IRB stamp) must be used to consent each subject. Investigators must retain copies of signed consent documents for six (6) years after close of the grant, or three (3) years if the study is unfunded.

Adverse Event Reporting - Adverse events occurring in the course of the protocol must be reported in e-protocol as soon as possible, but no later than five (5) working days.

Completion Reports - Notify the IRB when your study is complete by submitting a Final Report Form in e-protocol.

Consent form (when applicable) will be stamped and sent in a separate e-mail. Use only IRB approved copies of the consent forms, questionnaires, letters, advertisements etc. in your research.

Please contact the Human Research Protection Office if you have any further questions. Best wishes for a successful project.